
# MEASURING THE OPERATIONAL READINESS OF AN AIR FORCE NETWORK WARFARE SQUADRON

GRADUATE RESEARCH PAPER

Paul H. Orth, Major, USAF

AFIT/ICW/ENG/08-09

**DEPARTMENT OF THE AIR FORCE**
**AIR UNIVERSITY**
***AIR FORCE INSTITUTE OF TECHNOLOGY***

**Wright-Patterson Air Force Base, Ohio**

The views expressed in this graduate research project are those of the author and do not reflect the official policy or position of the United States Air Force, Department of Defense, or the U.S. Government.

AFIT/ICW/ENG/08-09

# MEASURING THE OPERATIONAL READINESS OF AN AIR FORCE NETWORK WARFARE SQUADRON

GRADUATE RESEARCH PAPER

Presented to the Faculty

Department of Electrical & Computer Engineering

Graduate School of Engineering and Management

Air Force Institute of Technology

Air University

Air Education and Training Command

In Partial Fulfillment of the Requirements for the

Degree of Master of Cyber Warfare

Paul H. Orth, BS, MS

Major, USAF

June 2008

AFIT/ICW/ENG/08-09

# MEASURING THE OPERATIONAL READINESS OF AN AIR FORCE NETWORK WARFARE SQUADRON

Paul H. Orth, BS, MS

Major, USAF

Approved:

| | |
|---|---|
| Paul Williams, Maj, PhD, USAF (Chairman) | Date |
| Richard A. Raines, PhD, USAF (Member) | Date |

AFIT/ICW/ENG/08-09

## Abstract

As part of its unit activation, the 315th Network Warfare Squadron (NWS) needed to measure and report its progression of unit readiness from activation to full wartime operations. The unit requested assistance from the Air Force Institute of Technology in developing criteria for declaring Initial Operational Capability (IOC) and Full Operational Capability (FOC) milestones. The research methodology included a review of current Department of Defense (DoD), Joint, and Air Force publications and instructions, as well as a review of the terminology used by three other unit activations: the new Air Force Cyberspace Command, an F/A-22 Fighter Squadron, and an Intelligence Squadron. By comparing the Joint Capabilities Integration and Development System (JCIDS) process and the Status of Resources and Training System (SORTS) process, the research concluded that the 315$^{th}$ NWS unit readiness should be measured and reported by SORTS Category Levels (C-Level) to support wartime missions, not by IOC and FOC milestones. This paper reviews SORTS computations and provides a case study of a notional Air Force NWS to propose that any new cyber squadron should report operational readiness starting with C-5 for unit activation, then C-3 to support initial operations, and finally C-1 to declare full wartime mission readiness.

# Table of Contents

Page

**ABSTRACT ..... IV**

**TABLE OF CONTENTS ..... V**

**LIST OF FIGURES ..... VI**

**ACRONYMS AND GLOSSARY ..... VII**

**I. INTRODUCTION ..... 1**

Background ..... 1
Motivation ..... 1
Purpose ..... 2

**II. METHODOLOGY ..... 3**

Policy Review ..... 3
Comparisons of Other Unit Activations ..... 3
Air Force NWS Case Study ..... 4

**III. LITERATURE REVIEW ..... 5**

DoD/Joint/Air Force Policy and Publications on IOC and FOC ..... 5
DoD/Joint/Air Force Publications on SORTS ..... 12
Comparisons of Other Unit Activations ..... 16

**IV. RESULTS/ANALYSIS ..... 18**

Measuring Readiness using SORTS ..... 18
Measuring SORTS Readiness for a Network Warfare Squadron ..... 20
315th NWS Case Study ..... 29
New Cyber Capability Development using JCIDS Process ..... 30

**V. CONCLUSIONS ..... 38**

**APPENDIX A. 27TH FIGHTER SQUADRON IOC CHECKLIST ..... 40**

**APPENDIX B. SAMPLE DOC STATEMENT ..... 47**

**BIBLIOGRAPHY ..... 51**

**VITA ..... 53**

# List of Figures

Page

FIGURE 3-1. JCIDS PROCESS....8

FIGURE 3-2. URGENT OPERATIONAL NEEDS....10

FIGURE 3-3. CHAIRMAN'S READINESS SYSTEM....15

FIGURE 4-1. CHANGING CRITICAL PERSONNEL INTO A P-LEVEL....21

FIGURE 4-2. REPORTING PERSONNEL REASON CODES....22

FIGURE 4-3. NON-AIRCRAFT UNITS-CHANGING O/H PERCENTAGE INTO AN S-LEVEL..23

FIGURE 4-4. REPORTING EQUIPMENT & SUPPLIES O/H REASON CODES....23

FIGURE 4-5. CHANGING EQUIPMENT CONDITION PERCENTAGE INTO R- LEVEL....25

FIGURE 4-6. REPORTING EQUIPMENT CONDITION REASON CODES....25

FIGURE 4-7. TRAINING PERCENTAGE T- LEVEL....26

FIGURE 4-8. REPORTING TRAINING REASON CODES....27

FIGURE 4-9. REPORTING PRIMARY REASON CODES....29

FIGURE 4-10. JCIDS PROCESS....31

FIGURE 4-11. WARFIGHTER URGENT OPERATIONAL NEEDS PROCESS....35

## Acronyms and Glossary

| Acronym | Definition |
|---|---|
| AFCD | Air Force Capabilities Document |
| AFCYBER | Air Force Cyberspace Command |
| AFI | Air Force Instruction |
| AFPD | Air Force Policy Document |
| AFROCC | Air Force Requirements for Operational Capabilities Council |
| AFSC | Air Force Specialty Code |
| AFSPCI | Air Force Space Command Instruction |
| AoA | Analysis of Alternatives |
| CCD | Combat Capability Document |
| CDD | Capabilities Development Document |
| CJCSI | Chairman of the Joint Chiefs of Staff Instruction |
| CJCSM | Chairman of the Joint Chiefs of Staff Manual |
| C-Level | Category Level |
| CPD | Capabilities Production Document |
| CRD | Capstone Requirements Document |
| CRS | Chairman's Readiness System |
| CSAF | Chief of Staff of the Air Force |
| DCR | Doctrine, Organization, Training, Materiel, Leadership and education, Personnel, and Facilities (DOTMLPF) Change Request |
| DOCS | Designed Operational Capability Statement |
| DoD | Department of Defense |
| DOTMLPF | Doctrine, Organization, Training, Materiel, Leadership and education, Personnel, and Facilities |
| DRRS | Department of Defense Readiness Reporting System |
| DSU | Direct Support Unit |
| EQREE | Equipment Condition Measured Area - Combat Essential Equipment |
| ERSA | Equipment Condition Subareas |
| ESORTS | Enhanced Status of Resources and Training System |
| ESSA | Equipment and Supplies Subarea |
| FAA | Functional Area Analysis |
| FNA | Functional Needs Analysis |
| FOC | Full Operational Capability |
| FSA | Functional Solution Analysis |

| Acronym | Definition |
|---|---|
| GSORTS | Global Status of Resources and Training System |
| ICD | Initial Capabilities Document |
| IOC | Initial Operational Capability |
| JCIDS | Joint Capabilities Integration and Development System |
| JP | Joint Publication |
| JQRR | Joint Quarterly Readiness Review |
| JROC | Joint Requirements Oversight Council |
| KPP | Key Performance Parameters |
| KSA | Key System Attributes |
| LIMFAC | Limiting Factor |
| MAJCOM | Major Command |
| MDA | Milestone Decision Authority |
| MRA | Mission Ready and Available |
| NMS | National Military Strategy |
| NWS | Network Warfare Squadron |
| OT&E | Operational Test and Evaluation |
| PAD | Program Action Directive |
| P-Level | Personnel Measurement Level |
| PRC | Personnel Reason Code or Primary Reason Code |
| R-Level | Equipment Condition Measurement Level |
| RRC | Equipment Condition Reason Code |
| RRP | Rapid Response Process |
| RSR | Requirements Strategy Review |
| S- Level | Supplies and Equipment On-Hand Measurement Level |
| SORTS | Status of Resources and Training System |
| SRC | Equipment and Supplies On-hand Reason Code |
| T-Level | Training Measurement Level |
| TRC | Training Reason Code |
| UMD | Unit Manning Document |
| UON | Urgent Operational Need |
| UTC | Unit Type Code |

AFIT/ICW/ENG/08-09

# MEASURING THE OPERATIONAL READINESS OF AN AIR FORCE NETWORK WARFARE SQUADRON

## I. Introduction

### Background

As part of its unit activation, the 315th Network Warfare Squadron (NWS) needed to measure and report its progression of unit readiness from activation to full wartime operations. The unit requested assistance from the Air Force Institute of Technology in developing criteria for declaring Initial Operational Capability (IOC) and Full Operational Capability (FOC) milestones (11:1). IOC and FOC are standard terminology for air and space squadrons, but as a new cyber squadron, the 315$^{th}$ NWS didn't have cyber examples of IOC and FOC criteria. The commander requested an outside perspective to validate the proposed IOC criteria developed in-house and to determine if the unit could leverage the criteria and processes used in the activation of squadrons supporting other weapon platforms. The main goal of this research project is to objectively measure and assess the operational readiness of an Air Force NWS for wartime taskings.

### Motivation

The Air Force recently changed its mission statement to include flying and fighting in the cyberspace domain alongside air and space. The service is

currently activating a new major command (MAJCOM), called the Cyberspace Command (AFCYBER), to support the new mission area, similar to Air Combat Command and Space Command. According to the AFCYBER Program Action Directive (6:4), the new command's mission will be to:

> "Provide combat ready forces trained and equipped to conduct sustained global operations in and through cyberspace, fully integrated with air and space operations. Present Air Force cyberspace capabilities to joint force commanders. AFCYBER will provide robust, survivable access to cyberspace with offensive and defensive capabilities that ensure freedom of action for our friends and allies, and deny the same to our adversaries."

As new cyber squadrons are created by AFCYBER, they will also need criteria for measuring readiness from activation to full operations attainment.

**Purpose**

This project proposes criteria for measuring the unit readiness of an Air Force NWS. By comparing the Joint Capabilities Integration and Development System (JCIDS) process and the Status of Resources and Training System (SORTS) process, the research concluded that the 315$^{th}$ NWS unit readiness should be measured and reported by SORTS Category Levels (C-Level) of readiness to support wartime missions, not by IOC and FOC milestones. This paper proposes that any new cyber squadron should report operational readiness starting with C-5 for unit activation, then C-3 to support initial operations, and finally C-1 to declare full wartime mission readiness.

The remainder of the paper presents the research methodology, literature review, research results and analysis, and conclusions.

## II. Methodology

The research into measuring and reporting the unit readiness an Air Force NWS primarily consisted of a policy review of current Department of Defense (DoD), Joint, and Air Force publications and instructions. In addition, the research considered IOC and FOC terminology used in the activations of the new MAJCOM, a Fighter Squadron and an Intelligence Squadron to determine if similar criteria can be used for an NWS. Finally, as the project sponsor, the 315th NWS served as a case study to validate the research and criteria as proposed in this paper.

### Policy Review

The policy review of current DoD, Joint, and Air Force publications and instructions started with a search of publications that referenced the terms *Initial Operational Capability, IOC, Full Operational Capability, FOC,* and *Readiness,* and later the *terms Joint Capabilities Integration and Development System, JCIDS, Status of Resources and Training System, SORTS,* and *Department of Defense Readiness Reporting System, DRRS* were added.

### Comparisons of Other Unit Activations

After reviewing current policy, the research included a review of the IOC and FOC used by three different unit activations: the new MAJCOM (AFCYBER); an F/A-22 Fighter Squadron (27th FS); and an Intelligence Squadron (11th IS).

The research considered the terminology used by the three different units and the criteria used for IOC and FOC determination.

## Air Force NWS Case Study

After determining the appropriate criteria for measuring and reporting the unit readiness an Air Force NWS, this project used the 315th NWS as a case study. By understanding its baseline operational readiness requirements to support its full wartime mission and determining its current operational readiness status in personnel, equipment and training, a classified operational readiness briefing was proposed with quantifiable measurements of initial and full operational readiness to AFCYBER. Since the 315$^{th}$ NWS readiness information is classified, a notional unit, called the 444th NWS, is portrayed as a case study to provide the readiness computations in this unclassified report from unit activation to full wartime readiness.

# III. Literature Review

The policy review of DoD, Joint, and Air Force publications, manuals, and instructions started with a focus on IOC, FOC and the JCIDS process. Later, the review shifted to include SORTS, which turned out to be the correct method of measuring and reporting the 315th NWS unit readiness. Additionally, documentation for the unit activations of AFCYBER, the 27th FS, and the 11th IS was reviewed to see how those units approached IOC and FOC. This literature review provides an overview of the documents that were researched; a detailed discussion is contained in the Results/Analysis section.

## DoD/Joint/Air Force Policy and Publications on IOC and FOC

The policy review included the analysis of the following DoD, Joint, and Air Force publications, manuals, and instructions:

Joint Publication 1-02 (JP 1-02) titled *Department of Defense Dictionary of Military and Associated Terms* provides standard US military and associated terminology for the DoD as a whole, including the joint activity of the US Armed Forces in both joint and allied operations (2:i). While it doesn't have a definition for FOC, it defines IOC as (2:263):

> "The first attainment of the capability to employ effectively a weapon, item of equipment, or system of approved specific characteristics that is manned or operated by an adequately trained, equipped, and supported military unit or force."

The Chairman of the Joint Chiefs of Staff Instruction 3170.01F (CJCSI 3170.01F) titled *Joint Capabilities Integration and Development System (JCIDS)*

establishes the JCIDS guidelines and procedures for the CJCS and Joint Requirements Oversight Council (JROC) to identify, assess and prioritize joint military capability needs (3:1). JCIDS replaced the previous bottom-up threat-based requirements generation process with a top-down capabilities-based approach that "better leverages the expertise of all government agencies, industry and academia to identify improvements to existing capabilities and to develop new warfighting capabilities" (3:A-1). It implements an integrated, collaborative process that utilizes joint concepts and integrated architectures to identify prioritized capability gaps and integrated doctrine, organization, training, materiel, leadership and education, personnel and facilities (DOTMLPF) solutions to resolve those gaps in order to advance joint warfighting (3:A-1). JCIDS is closely linked to the acquisition process where new capabilities are identified and developed using a series of documents (3:A-5 thru A-8): Initial Capabilities Document (ICD), DOTMLPF Change Request (DCR), Capability Development Document (CDD), Capability Production Document (CPD) and Capstone Requirements Document (CRD).

The Chairman of the Joint Chiefs of Staff Manual 3170.01C (CJCSM 3170.01C) titled *Operation of the Joint Capabilities Integration and Development System (JCIDS)* sets forth guidelines and procedures for the development and staffing of JCIDS documents (4:1). While not mentioned in the CJCSI, IOC and FOC are referenced in this CJCSM but only within the formats of the CDD and CPD. Appendix A of Enclosure F provides the formats of all JCIDS documents. Within the CDD format, IOC and FOC are stated below (4:F-A-6):

> "Assets Required to Achieve Initial Operational Capability (IOC). Describe the types and initial quantities of assets required to attain IOC. Identify the operational units (including other Services or government agencies, if appropriate) that will employ the capability, and define the initial asset quantities (including initial spares and training and support equipment, if appropriate) needed to achieve IOC.
> Schedule and IOC and Full Operational Capability (FOC) Definitions. Define what actions, when complete, will constitute attainment of IOC and FOC."

Within the CPD format, IOC and FOC are stated below (4:G-A-5):

> "Assets Required to Achieve FOC. Describe the types and quantities of assets required to attain FOC. Identify the operational units (including other Services or government agencies, if appropriate) that will employ the capability and define the asset quantities (including spares, training, and support equipment, if appropriate) required to achieve FOC.
> Schedule and IOC and FOC Definitions. Define the actions that, when complete, will constitute attainment of IOC and FOC for the current increment. Specify the target date for IOC attainment."

Air Force Instruction 10-601 (AFI 10-601) titled *Capabilities Based Requirements Development* implements JCIDS for the Air Force and states the intent "is to facilitate rapid development and fielding of affordable and sustainable operational capabilities needed by the combatant commander" (5:5). It "applies to all unclassified, collateral, compartmented and special access programs" (5:1).

For the Air Force, the MAJCOM or responsible agency (sponsor) normally develops requirements documents that are used throughout the JCIDS process for each Milestone decision, including IOC and FOC (5:11). The AFI discusses eight different capabilities documents (five joint and three AF-specific), including the most common ones: ICD, CDD, CPD, DCR, and Combat Capability Document (CCD). IOC and FOC criteria must be specified in the CDD and CPD documents. AF/A5R provides oversight of the Air Force capabilities-based

requirements development process and each milestone decision requires Air Force Requirements for Operational Capabilities Council (AFROCC) approval (5:17). Figure 3-1 shows the full JCIDS process as represented in AFI 10-601, which will be explained in more detail in Results/Analysis. For now, note the lengthy and complicated process required to complete the capabilities documents in order to develop and field a new capability to achieve IOC and FOC.

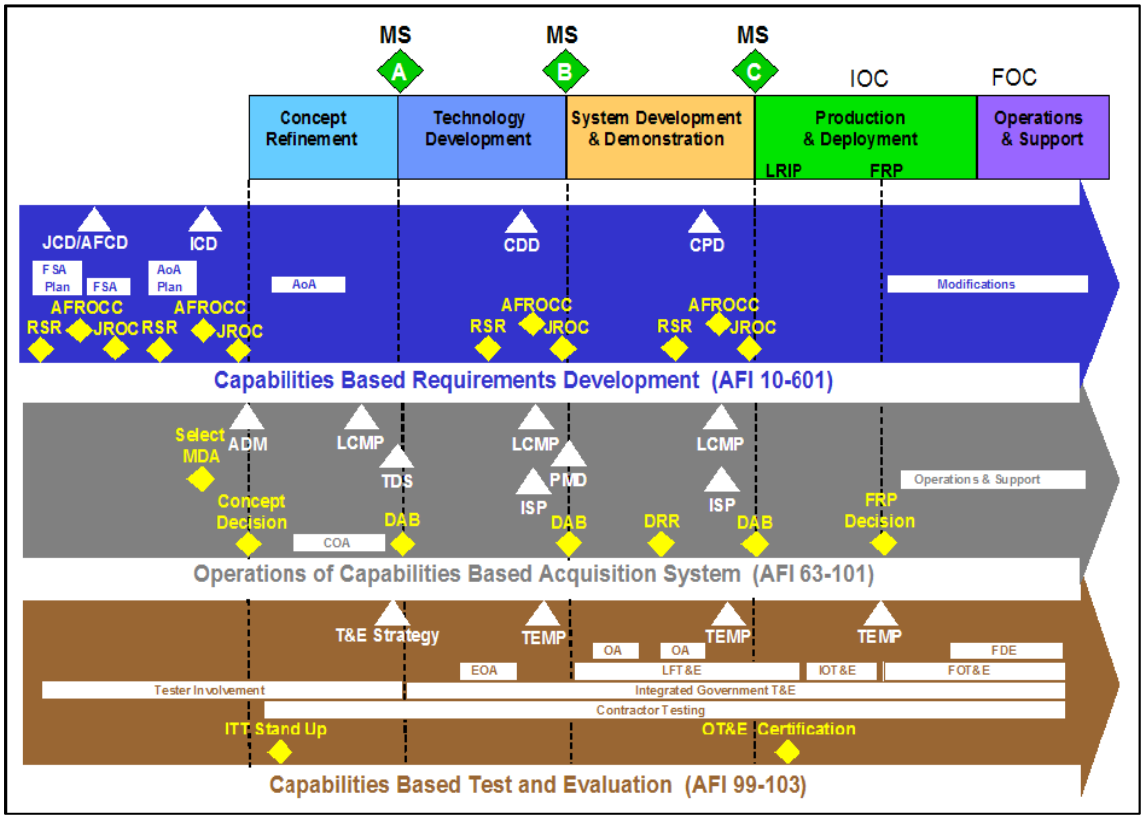



**Figure 3-1. JCIDS Process (5:11)**

AFI 10-601 defines IOC as (5:55):

"That first attainment of the capability to employ effectively a weapon, item of equipment, or system of approved specific characteristics with the appropriate number, type, and mix of trained and equipped personnel necessary to operate, maintain, and support the system".

It also defines FOC as (5:54):

> "The full attainment of the capability to effectively employ a weapon system, item of equipment, or system of approved specific characteristics, which is manned and operated by a trained, equipped, and supported military unit or force. FOC is not necessarily a date; it defines the criteria necessary to declare full operational capability."

While the entire JCIDS process looks very arduous, the AFI defines a streamlined process that could be pursued for the timely implementation of cyber capabilities within the formal JCIDS process. The Warfighter Urgent Operational Needs (UON) process shortens the capabilities development timeline for urgent requirements identified during conflict or crisis situations that are life threatening or combat mission threatening (5:64). It is “intended to field readily available systems through accelerated means” (5:64). The CCD is “used by the Air Force in lieu of the ICD, CDD and CPD to support fielding an interim solution to a warfighter’s urgent capability needs” (5:68). If new cyber capabilities are readily available and support the criteria of the UON process, a CCD could be pushed through quickly to formalize the IOC/FOC criteria for the interim solution. The Lead MAJCOM (AFCYBER) “would follow-up by processing the required JCIDS documents (ICD, CDD, CPD) for the long-term solution” (5:68). Figure 3-2 shows the full UON process as represented in AFI 10-601, which will be explained in more detail in Results/Analysis. For now, note the simpler process and short timeline compared with the full JCIDS process in Figure 3-1.

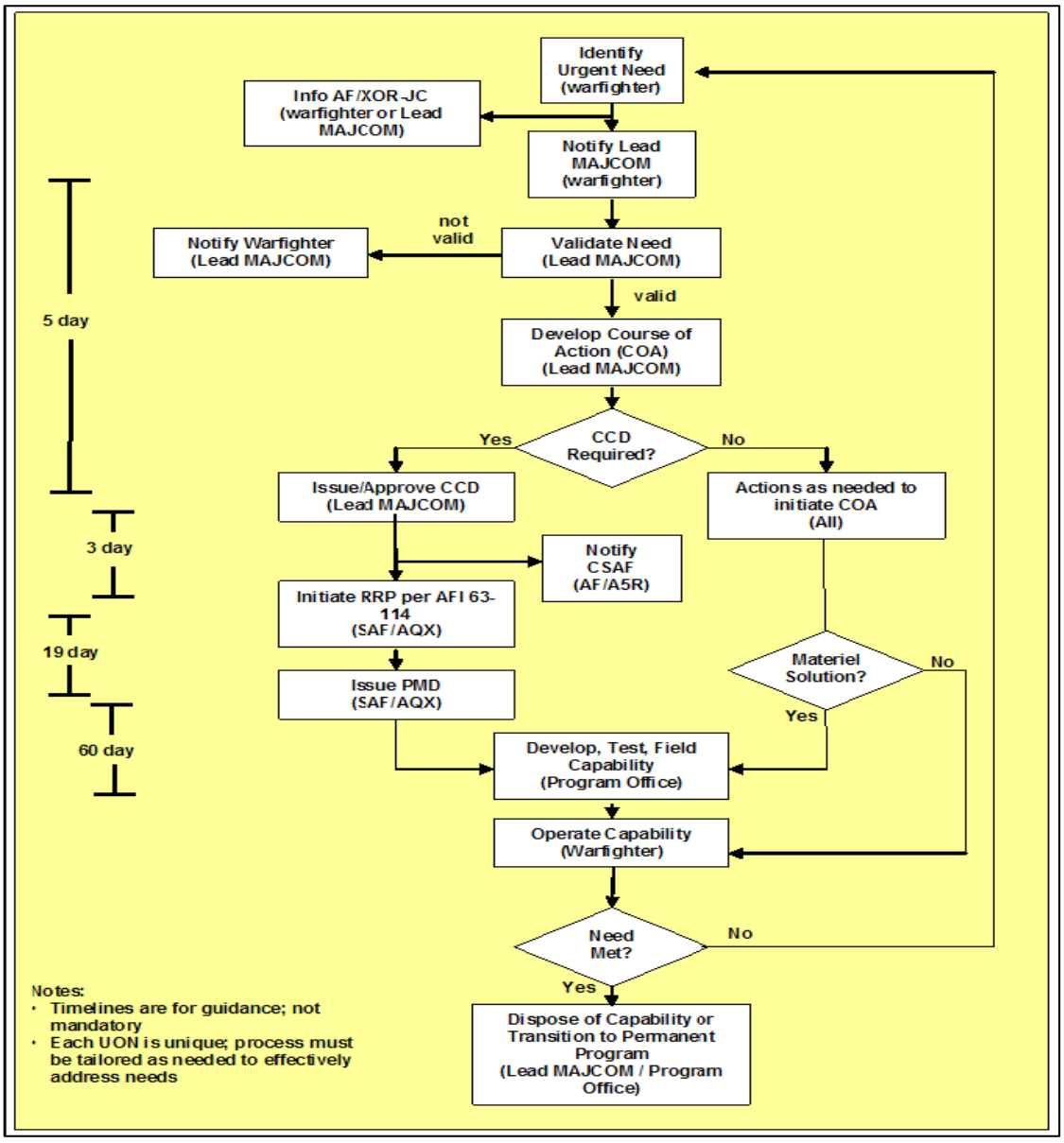



**Figure 3-2. Urgent Operational Needs (5:65)**

Air Force Space Command Instruction 10-601 (AFSPCI 10-601) titled *Declaration of Initial Operational Capability (IOC) and Full Operational Capability (FOC)* has been superseded due to the new JCIDS process, but it provided very clear guidance on the declaration of IOC and FOC. It specifically ties IOC and FOC to acquired systems, not unit activations. It states (12:3):

> "IOC and FOC are terms that apply to an operational system that goes through an acquisition process. These terms do not apply to units or organizations. A new unit would be "activated," not declared IOC. However, a newly activated unit is often part of the IOC decision relating to the system the unit operates. There is no specific Air Force guidance directly linking a specific unit's Status of Resources and Training Systems (SORTS) C-Rating with IOC or FOC. However, IOC and FOC indicate a certain capability or readiness and SORTS should be a consideration for IOC declaration. AFSPC should strive to achieve a C-Rating of at least C-3 for IOC and a C-Rating of C-1 for FOC."

The 'C-Rating' will be defined in the review of the next document, AFI 10-201. AFSPCI 10-601 also states (12:3):

> "FOC declaration applies only to those systems having an FOC declaration as part of their acquisition and deployment strategy, as defined in the ORD. If a system does not have an ORD, the applicable system's ICT will develop and document appropriate IOC/FOC Evaluation Criteria. Nominally, FOC is not declared until Air Force Materiel Command has delivered the full system as defined in the system's ORD, and corrected all the system's discrepancies."

Based upon the reviewed documents, IOC and FOC are terms associated with developing and fielding a new capability (weapon, item of equipment, or system), not the activation of a new unit. However, a new unit may be associated with the IOC and FOC milestones of a newly developed capability. After the AFPSCI equated an activating unit's SORTS C-rating with IOC and FOC, the research was adjusted to include SORTS.

**DoD/Joint/Air Force Publications on SORTS**

AFI 10-201 titled *Status of Resources and Training System* implements Air Force readiness reporting procedures and supports the CJCS Global SORTS (GSORTS) (8:1). According to the AFI, SORTS has a threefold purpose (8:8):

> "It provides data critical to crisis planning; it provides for the deliberate or peacetime planning process; and it is used by the Chief of Staff United States Air Force (CSAF) and subordinate commanders in assessing their effectiveness in meeting Title 10*, "United States Code*," responsibilities to organize, train, and equip forces for combatant commands".

SORTS indicates a unit's ability to undertake its full wartime mission as defined in the Designed Operational Capability Statement (DOCS). Category-Levels (C-levels) "reflect the degree to which unit resources meet prescribed levels of personnel, equipment, and training" (8:16). What the AFSPCI 10-201 called 'C-Ratings,' are now called 'C-Levels.' AFI 10-201 defines specific C-levels for unit readiness, which are essential for the proposal set forth later in this paper. The definitions for C-Levels are quoted below from AFI 10-201 (8:16):

> "C-1. The unit possesses the required resources and is trained to undertake the *full wartime mission(s)* for which it is organized or designed. The resource and training area status will neither limit flexibility and methods for mission accomplishment nor increase vulnerability of unit personnel and equipment. The unit does not require any compensation for any deficiencies.
>
> C-2. The unit possesses the required resources and is trained to undertake *most of the wartime mission(s)* for which it is organized or designed. The resource and training area status may cause isolated decreases in flexibility in methods for mission accomplishment, but will not increase the unit's vulnerability under most envisioned operational scenarios. The unit would require little, if any, compensation for deficiencies.
>
> C-3. The unit possesses the required resources and is trained to undertake *many, but not all, portions of the wartime mission(s)* for which it

is organized or designed. The resource and training area status will result in significant decrease in flexibility for mission accomplishment and will increase vulnerability of the unit under many, but not all, envisioned operational scenarios. The unit would require significant compensation for deficiencies.

C-4. The unit *requires additional resources or training to undertake its wartime mission(s),* but it may be directed to undertake portions of its wartime mission(s) with resources O/H.

C-5. The unit is *undergoing a Service-directed resource action* and is not prepared, at this time, to undertake the mission set for which it is organized or designed*. Within the CBDRT report*, units will use C-5 to indicate when they have no NBC defense equipment or training requirements.

C-6. The unit is *not required to measure assets in a specified area*. C-6 (not a rating) may not be used as an Overall C-level.

Assigning C-5 as the Overall C-level. A parent MAJCOM may authorize use of C-5 for units undergoing a service-directed resource action and which are not prepared to undertake the mission set for which they are organized or designed. C-5 cannot be reported in any measured resource area and C-5 status will not exceed one year for Active Duty or three years for Guard/Reserve units from the designated start date of the conversion or transition. C-5 is only used when authorized by the parent MAJCOM and one of the following conditions exists:

> Unit Transition. Unit transitions include modernization/conversion of major equipment (F-4s to F-16s), modernization/upgrade of software in major equipment (extensive equipment testing/personnel user training), a change in a unit's mission (which can be accomplished without changing the major equipment involved), and/or a change in a unit's home station location (higher headquarters approval may be required). When a unit is undergoing a transition and the first measured area C-level falls to C-4, C-5 may be authorized. Report C-5 as the Overall C-level and report the current measured area C-levels until the old DOC is rescinded and the new DOC is effective. Units will continue to report their Overall C-level as C-5 until all measured areas (except areas authorized to report C-6) have improved to C-3. SORTS reports and DOC Statements are based on the wartime mission(s) for which the unit is organized or designed. Unit transitions are not wartime missions. Therefore, separate DOC Statements will not be written for transitions.

> Unit Activation or Re-activation. Activating units may be authorized to report C-5 as their Overall C-level until all measured areas have reached a maintainable C-3 (except measured areas authorized to be reported as Code 6) or the end of the designated activation period, whichever occurs first."

As proposed by the AFSPCI, when equating C-levels with IOC and FOC, C-5 should be used for unit activation, C-3 should be used for initial operations, and C-1 should be used for full wartime operations. However, some units that support a Unified Combatant Command may also need to report readiness via the new Department of Defense Readiness Reporting System (DRRS). The research also explored the difference between SORTS and DRRS reporting.

CJCSI 3401.01D, titled *Chairman's Readiness System (CRS)* establishes the policy and procedures for the US Armed Forces to report and assess current readiness through the CRS (1:1). The CRS provides DoD leadership a current assessment of military readiness to execute the National Military Strategy (NMS). Services report their SORTS information through the GSORTS, which is the single automated reporting system for tactical readiness within the DoD that functions as the authoritative central registry of US Armed Forces units and organizations, as well as certain foreign organizations (1:GL-5). In addition to GSORTS, the DRRS, which is still under development, supports Title 10 directives that task the Chairman to conduct the Joint Quarterly Readiness Review (JQRR) in order to assess the operational readiness of US armed forces (1:2). Enhanced Status of Resources and Training System (ESORTS) is a subset of DRRS and is designed to highlight deficiencies of current unit and

organizational readiness status in the areas of training, personnel, equipment, ordnance, and sustainment (1:GL-4). For purposes of the JQRR, Services report current overall readiness using actual unit or aggregated C-Level GSORTS data (1:D-10). Figure 3-3 shows the reporting elements of the CRS as represented in CJCSI 3401.01D.

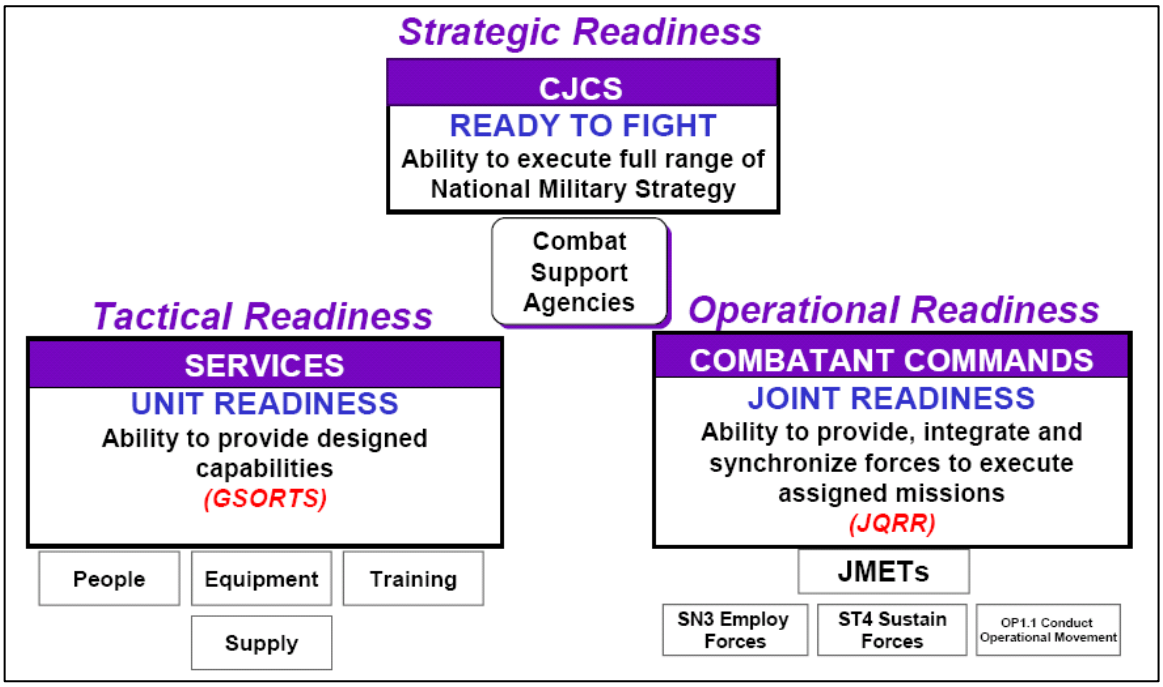



**Figure 3-3. Chairman's Readiness System (1:A-1)**

Air Force Policy Directive (AFPD) 10-2, titled *Readiness,* "establishes Air Force readiness requirements and responsibilities, and directs MAJCOMs to report accurate readiness data in support of the decision-making processes" (7:1). The AFPD highlights the different readiness reporting assessments. It defines DRRS as an "…OSD net-centric, web-enabled initiative to manage and report the readiness of DoD forces to execute the NMS," which is supported by ESORTS to facilitate the JQRR process (7:2). It also defines GSORTS as "a

CJCS-controlled, automated data system primarily created to provide the President and the Secretary of Defense authoritative information related to the readiness of military forces to meet assigned missions and goals" (7:2).

To summarize the difference between SORTS and DRRS, SORTS is used for tactical-level unit readiness reporting to Service Departments in support of DOCS assigned missions, and DRRS will be used for operational-level unit readiness reporting to Unified Combatant Commands in support of joint mission essential tasks and the JQRR. Since DRRS is still in development, the instruction states that further guidance for implementation is forthcoming (1:2). Although it appears DRRS may eventually become the one system to report all readiness data, at the time of this research report the published directives require units to report the different readiness measurements through the two different systems.

**Comparisons of Other Unit Activations**

In addition to the policy review, the research also considered the IOC and FOC terminology used in the new unit activations for a MAJCOM (AFCYBER), a Fighter Squadron (27$^{th}$ FS) and an Intelligence Squadron (11$^{th}$ IS).

The HQ USAF Program Action Directive (PAD) 07-08 titled *Implementation of the Secretary of the Air Force Direction to Establish Air Force Cyberspace Command,* officially activates the MAJCOM (6:1). Although the original draft PAD used IOC and FOC terminology when identifying responsibilities and capabilities of the command activation, the signed version of

the PAD changed the terminology from *IOC* and *FOC* to *Phase I* and *Phase II*, respectively (6:1). The change implies that the terms IOC and FOC are not appropriate for the stand-up of an organization that is not associated with a newly developed capability.

As a new F/A-22 Fighter Squadron (FS), the 27th FS provided stop light charts and a detailed checklist for actions required to meet IOC (16:1). IOC was defined as achieving the ability to deploy eight F/A-22s anywhere in the world, and FOC was defined as achieving the ability to deploy a full complement of F/A-22s anywhere in the world (17:1). See the IOC checklist at Appendix A. Unfortunately, the IOC and FOC criteria are strictly tied to the F/A-22 fielding and did not provide criteria that could be leveraged by an Air Force NWS.

As a new Intelligence Squadron (IS), the 11th IS also provided stop light charts that are classified SECRET but are essentially tied to IOC criteria for providing intelligence analysis for the Predator Unmanned Aerial Vehicle (9:1). The charts also did not provide criteria that could be leveraged by a NWS.

This review of the terminology and criteria used in these three other unit activations confirmed that only units being activated to employ a new capability have associated IOC and FOC milestones.

# IV. Results/Analysis

Based upon the reviewed documents, IOC and FOC are terms associated with the fielding of new capabilities developed using the JCIDS process (5:54-55), not the activation of a new unit. However, a unit activation, such as the 11th IS and 27th FS, may be associated with the IOC and FOC milestones of a newly developed capability (12:3). While it may be advantageous to accomplish the formal JCIDS process in declaring IOC and FOC of a new cyber capability, that could take considerable time. The 315th NWS Commander decided there was no need to complete the JCIDS process to declare the squadron ready for wartime operations (10:1), so the IOC and FOC terminology was dropped and the SORTS C-Levels were pursued for measuring and reporting unit readiness.

The research analyzed the SORTS process and proposed unit readiness measurements for an Air Force NWS that were validated by the 315$^{th}$ NWS. Unclassified SORTS measurements for a notional NWS are provided to reflect SORTS reporting from unit activation through full wartime operations. In addition, an analysis of the formal JCIDS process required to develop a new cyber capability is provided later in this section.

**Measuring Readiness using SORTS**

SORTS measurement is based upon a unit's ability to undertake their full wartime mission identified in its DOCS, AF Form 723; additional missions are identified on Secondary or Tertiary DOCS (8:13-14). Measured units include

planned and actual Joint Task Force Headquarters, combat, combat support, and combat services support units as described in AFI 10-201. MAJCOM Functional Area Managers develop measurement criteria regarding unit readiness (8:8). Measured units report SORTS in accordance with their DOCS, which provides baseline measurement information including the Mission Tasking Narrative (full wartime mission), Response Time, Unit Manning Document (UMD), Unit Tasking Code (UTC), Direct Support Unit (DSU), Equipment and Supplies Subareas (ESSA), and Unit Training Method (8:9-10). See the sample DOCS at Appendix B for a notional Air Force NWS.

The SORTS baseline is reflected in the definition of Category Level 1 (C-1) indicating the unit possesses the required resources and is trained to undertake the full wartime mission(s) for which it is organized or designed (8:9). At C-2, the unit has the ability to undertake most of the wartime mission(s), and at C-3, it has the ability to undertake many, but not all, portions of the wartime mission(s). In addition, C-4 is used when a unit requires additional resources or training to undertake its wartime mission, C-5 is used when a unit is undergoing a Service-directed resource action and is not prepared to undertake the mission, and C-6 means the unit is not required to measure assets in a specified area. AFI 10-201 further clarifies that C-5 is only used when authorized by a parent MAJCOM during either a Unit Transition (e.g., change in mission or location) or Unit Activation/Re-activation/Deactivation (8:16).

C-levels represent, via a five point scale, the degree of readiness to which a unit meets standards established within the four measured resource areas

(8:37): 1) Personnel (P-Level), 2) Equipment and Supplies On-hand (S-Level), 3) Equipment Condition (R-Level), and 4) Training (T-Level). In addition, the measured unit commander must assign an Overall C-level to reflect unit readiness. As stated earlier, this paper proposes that an Air Force NWS should report operational readiness starting with C-5 for unit activation, then C-3 to support initial operations, and finally C-1 to declare full wartime mission readiness.

The P-Level is based upon UMD authorizations or UTC requirements and is computed based upon percentages of total and critical personnel available to support the unit's wartime mission (8:9). The S-Level measurement is based upon authorization documents such as Allowance Standards, Air Staff-level functional area guidance, equipment and supplies lists, or UTC requirements (8:10). The R-Level measurement is based upon the condition of possessed equipment and supplies (8:10). The T-Level represents assigned personnel that are certified to support the mission and is computed using either Training Method B (Crew Training) or Training Method C, Option 1 (Unit Training) or Option 2 (CAF Aviation Unit Training), as identified on the DOCS (8:10). The Overall C-Level is normally reported as the lowest of the four measured resource areas but must be a realistic indication of the unit's readiness (8:17).

**Measuring SORTS Readiness for a Network Warfare Squadron**

So, how should a new Air Force NWS measure its current readiness? First, the unit needs to assess its full wartime readiness. To do this, the unit

reviews its DOCS, UMD, UTC, equipment authorizations and training requirements. Once the baseline requirements are assessed to staff, train, and equip the unit to accomplish its wartime mission, the measurements that equate to C-1 are established (8:9-10). The sample DOCS at Appendix B for a notional unit, called the 444th NWS, is used in the following examples to reflect SORTS reporting for an Air Force NWS at unit activation (C-5), initial operations (C-3), and full wartime readiness (C-1).

Now the unit can start assessing its current readiness status in relation to this C-1 baseline. Before the Overall C-Level can be determined, the individual resource measurements must be computed. The first assessment is the personnel measurement, or P-Level, to indicate the current status of the unit's authorized personnel. AFI 10-201 Chapter 3 focuses on the Personnel Measured Area Data. First, divide the number of personnel currently assigned to the unit by the number of personnel authorized in the UMD (8:62). Table 3.1 Rule 26 indicates that personnel assigned to an Information Warfare Unit, which is interpreted as a NWS, are filling critical positions (8:67). Therefore, AFI 10-201 Table 3.4 is used to convert the personnel percentage into the P-Level (8:70), as shown in figure 4-1.

| Rule | A | B |
|---|---|---|
| | If critical personnel percentage is in the range of | then the critical personnel P-level is |
| 1 | 85 to 100 | P-1 |
| 2 | 75 to 84 | P-2 |
| 3 | 65 to 74 | P-3 |
| 4 | 0 to 64 | P-4 |

**Figure 4-1. Changing Critical Personnel into a P-Level (8:70)**

In addition, a Personnel Reason Code (PRC) is required whenever the P-Level is less than P-1 (8:62). AFI 10-201 Table 3.5 provides a listing of rules to determine an appropriate PRC (8:71-72). A few applicable PRCs are listed below in figure 4-2 for a NWS:

| RULE | A<br>If the primary reason that the personnel measured resource area is not P-1, is | B<br>then in the field PRRES report |
|---|---|---|
| 2 | organization activating | P05 |
| 24 | personnel shortage - weapon system officer | P55 |
| 30 | personnel shortage - computer operator | P61 |

**Figure 4-2. Reporting Personnel Reason Codes (8:71-72)**

Now, how does this compute for the notional case study, the 444th NWS? Suppose their UMD has 75 positions that are all designated as critical. Until the unit has at least 49 personnel on staff (65% manning), the P-Level will be P-4, which supports a C-5 unit activation rating and a PRC of P05. When the unit has 49-63 personnel on staff (65-84% manning), the P-Level will support a C-3 initial operations rating and should report a PRC of either P55 or P61. Once the unit has 64 or more personnel on staff (85% manning), the P-Level will support a C-1 full wartime mission rating and no longer requires a PRC.

The next assessment is the Equipment and Supplies On Hand measurement, or S-Level, to indicate the status of the unit's authorized equipment and supplies. AFI 10-201 Chapter 4 focuses on the Equipment and Supplies On Hand Measured Area Data. The measurement allows up to nine

different equipment and supplies subareas (ESSA) (8:73) that are divided into two categories: combat essential and support equipment (8:76). AFI 10-201 Table 4.1 Rule 26 specifies that an Information Warfare Unit, or NWS, reports ESSA2 for combat essential equipment and ESSA 6-9 for support equipment (8:80). For each subarea specified in the DOCS, divide the number of items currently possessed by the number of items authorized or required (8:76). Then use AFI 10-201 Table 4.3 to convert the equipment percentage into the S-Level (8:77), as shown in figure 4-3.

| RULE | A | B |
|---|---|---|
| | If the lower of the combat essential equipment and support equipment O/H percentages is in the range from | then for the equipment and supplies O/H S-level in the label ESRAT report |
| 1 | 90 to 100 | S-1 |
| 2 | 80 to 89 | S-2 |
| 3 | 65 to 79 | S-3 |
| 4 | 0 to 64 | S-4 |

**Figure 4-3. Non-Aircraft Units-Changing O/H Percentage into an S-Level (8:83)**

In addition, an Equipment and Supplies On Hand Reason Code (SRC) is required whenever the S-Level is less than S-1 (8:77). AFI 10-201 Table 4.5 provides a listing of rules to determine an appropriate SRC (8:114-116). A couple of applicable SRCs are listed below in figure 4-4 for a NWS:

| RULE | A | B |
|---|---|---|
| | If the primary reason that the equipment and supplies O/H measured resource area is not S-1, is | then in the field ESRES report |
| 13 | organization recently activated/reorganized | S18 |
| 27 | shortage - authorized equipment | S42 |

**Figure 4-4. Reporting Equipment & Supplies O/H Reason Codes (8:114-116)**

To compute the S-Level for the notional case study, the 444th NWS, suppose they have one set of equipment for each ESSA2 and ESSA6. The S-Level should reflect the lowest percentage of the two subareas. Until the unit has both ESSAs at 65%, the S-Level will be S-4, which supports a C-5 unit activation rating and a SRC of S18. When the unit has both ESSAs at 65-89%, the S-Level will support a C-3 initial operations rating and should report an SRC of S42. Once the unit has both ESSAs at 90% or more, the S-Level will support a C-1 full wartime mission rating and no longer requires an SRC.

The equipment condition measurement, or R-Level, is used to measure the combat essential and support equipment that can be made ready to undertake the wartime mission within the unit's response time. AFI 10-201 Chapter 5 focuses on the Equipment Condition Measured Area Data. The measurement allows up to nine different equipment condition subareas (ERSA) (8:125) that are similarly divided into two categories: combat essential and support equipment (8:125). Compute the equipment condition of each subarea by dividing the number of equipment items mission ready and available (MRA) by the number of equipment items possessed (8:125). AFI 10-201 Table 5.1 Rule 26 specifies that an Information Warfare Unit, or NWS, reports the status of combat essential equipment listed in DOCS that is MRA by calculating a percentage for each entry and using the lowest value as Equipment Condition Measured Area - Combat Essential Equipment (EQREE) (8:129). Then use AFI

10-201 Table 5.6 to convert the equipment condition percentage into the R-Level (8:126), as shown in figure 4-5:

| RULE | A | B |
|---|---|---|
| | If the lowest of the combat essential and Support equipment condition percentage is in the range from | then for the equipment condition R-level in label ERRAT report |
| 1 | 90 to 100 | R-1 |
| 2 | 70 to 89 | R-2 |
| 3 | 60 to 69 | R-3 |
| 4 | 0 to 59 | R-4 |

**Figure 4-5. Changing Equipment Condition Percentage into R- Level (8:157)**

In addition, an Equipment Condition Reason Code (RRC) is required whenever the R-Level is less than R-1 (8:126). AFI 10-201 Table 5.5 provides a listing of rules to determine an appropriate RRC (8:155-157). A few applicable RRCs are listed below in figure 4-6 for a NWS:

| RULE | A | B |
|---|---|---|
| | If the primary reason that the equipment condition measured area is not R-1, is | then in the field ERRES report |
| 27 | equipment shortage | R54 |
| 45 | not mission capable - maintenance or supply unscheduled | RAA |
| 51 | partial mission capable - maintenance | RAG |

**Figure 4-6. Reporting Equipment Condition Reason Codes (8:155-157)**

To compute the R-Level for the notional case study, the 444th NWS, suppose they have one set of equipment for each ERSA2 and ERSA6 to report the condition. The R-Level should reflect the lowest percentage of the two subareas. Until the unit has both ERSAs at 60%, the R-Level will be R-4, which supports a C-5 unit activation rating and a RRC of R54. When the unit has both

ERSAs at 60-89%, the R-Level will support a C-3 initial operations rating and should report an RRC of either RAA or RAG. Once the unit has both ERSAs at 90% or more, the R-Level will support a C-1 full wartime mission rating and no longer requires an RRC.

The final assessment is the Training measurement, or T-Level, to indicate the status of the unit's training needed to support the wartime mission. AFI 10-201 Chapter 6 focuses on the Training Measured Area Data. Table 6.1 Rule 11 indicates that "all other unit types," including a NWS, will use Training Method C, Option 1 (8:183). Therefore, divide the number of personnel currently certified by the number of personnel assigned requiring the training (8:179). The number used as 'personnel assigned requiring the training' may not exceed the total personnel authorized. Then use AFI 10-201 Table 6.3 to convert the training percentage into the T-Level (8:181), as shown in figure 4-7:

| RULE | A | B |
|---|---|---|
| | If the training percentage is in the range from | then the training T-level is |
| 1 | 85 to 100 | T-1 |
| 2 | 70 to 84 | T-2 |
| 3 | 55 to 69 | T-3 |
| 4 | 0 to 54 | T-4 |

**Figure 4-7. Training Percentage T- Level (8:184)**

In addition, a Training Reason Code (TRC) is required whenever the T-Level is less than T-1 (8:182). AFI 10-201 Table 6.5 provides a listing of rules to determine an appropriate TRC (8:204-205). A couple of applicable PRCs are listed below in figure 4-8 for a NWS:

| RULE | A | B |
|---|---|---|
| | If the primary reason that the training measured resource area is not T-1 is | then in the field TRRES report |
| 13 | organization activating | T24 |
| 20 | shortage - personnel | T37 |

**Figure 4-8. Reporting Training Reason Codes (8:204-205)**

To complete the final computation for the notional case study, the 444th NWS, the unit must first determine the number of personnel assigned requiring training. For each calculation, suppose all 75 positions on their UMD require certification and all of the personnel have been assigned. Until the unit has at least 42 personnel certified (56% trained), the T-Level will be T-4, which supports a C-5 unit activation rating and a TRC of T24. When the unit has 42-63 personnel certified (56-84% trained), the T-Level will support a C-3 initial operations rating and should report a TRC of T37. Once the unit has 64 or more personnel certified (85% trained), the T-Level will support a C-1 full wartime mission rating and no longer requires a TRC.

Now that the measurements for the four measured resource areas have been computed, the NWS Commander needs to report an overall C-Level rating for the unit (8:17). According to AFI 10-201, normally the lowest level of the four measured resource areas is reported as the Overall C-Level provided it is a realistic indication of the unit's readiness (8:17). Otherwise, the commander can assess the Overall C-Level to a level that better indicates unit readiness. In addition, the commander should consider objective factors, such as inspection results and program readiness reviews, as well as subjective factors, such as

personnel turnover rates, availability of special equipment, completion of specialized training, and another unit's C-Level when also required for a specific mission (8:17).

The unit commander must also provide Narrative Remarks to explain the Overall C-Level when it is below C-1 (8:19). These remarks must clearly and plainly articulate why the unit is less than C-1, what actions are being taken to resolve the problem, what resources are needed, and when the C-Level will change. The remarks must also address any limiting factor (LIMFAC) that is identified as a problem, deficiency, or condition that affects the unit's ability to accomplish its mission and usually requires assistance from higher headquarters (8:40).

AFI 10-201 Chapter 2 provides details on preparing Narrative Remarks. Examples for each of the four measured resource areas and Overall C-Level are provided below (8:45-48):

P-Level: If personnel shortages exist, include them in a remark and provide a listing of AFSCs, number of personnel authorized, number of personnel assigned, number of personnel available, number of personnel in upgrade training, the PRC, corrective actions, and a get well date for each.

S-Level: Ensure remarks accurately reflect the on-hand versus authorized quantities, item data (serial/stock number, etc.), the SRC, and a get well date for each.

R-Level: Ensure each subarea field with a percentage "less than 90%" is described in the associated remark.

T-Level: If an AETC allocation deficiency exists, include the deficiency short title, summary of current or future deficiency, current status or action taken to resolve, additional actions required, and the impact on the unit's mission.

Overall C-Level: Summarize problems in sufficient detail to ascertain unit readiness, such as identifying which mission(s) the unit cannot fully support.

Along with narrative remarks to explain the rating below C-1, the unit must assign a Primary Reason Code (PRC) against the Overall C-Level (8:48). AFI 10-201 Table 2.5 provides a listing of Standard Reason Codes for Air Force Units to determine an appropriate PRC (8:56), as shown in figure 4-9:

| Rule | Overall C-Level | Reason |
|---|---|---|
| 1 | less than C-1 and the area most affecting the C-Level is personnel | P |
| 2 | less than C-1 and the area most affecting the C-Level is equipment and supplies O/H | S |
| 3 | less than C-1 and the area most affecting the C-Level is equipment condition | R |
| 4 | less than C-1 and the area most affecting the C-Level is training | T |
| 5 | subjectively changed by the commander | X |
| 6 | C-5 and a resource area is C-4 for service-directed resource action | N |

**Figure 4-9. Reporting Primary Reason Codes (8:56)**

## 315th NWS Case Study

To assist in this research project, the 315th NWS provided a draft briefing with its proposed IOC criteria, its DOCS, and current readiness data for training and personnel (11:1). By validating the official wartime mission, authorized personnel, required equipment, and the approved training method, objective

SORTS measurement data was developed to determine the 315th NWS' current readiness status and to identify the shortfalls to be addressed in order to reach full wartime mission readiness (C-1). Their original IOC briefing was also reorganized into the SORTS reporting format below to track the unit readiness from C-3 to C-1:

Proposed New Readiness Reporting – explaining SORTS measurements

The Defined Mission – the baseline readiness achieved at C-1

Overall C-level Rating – current readiness to support wartime mission

Personnel Measurement - identifying current staffing levels

Equipment and Supplies On-hand and Condition Measurements - including all equipment requirements to fulfill wartime mission

Training Measurement – the certification level of assigned personnel

Shortfalls and Way Ahead - identifying any LIMFAC or issue that will be addressed in SORTS Narrative Remarks and the forecasted change in C-level.

**New Cyber Capability Development using JCIDS Process**

For future cyber capabilities (such as tools, systems, payloads, etc.), AFCYBER is expected to follow the JCIDS process. While AFI 10-601 Chapters 4-8 have all the details, a cursory review of the process is provided in this section, as shown in Figure 4-10 from AFI 10-601.

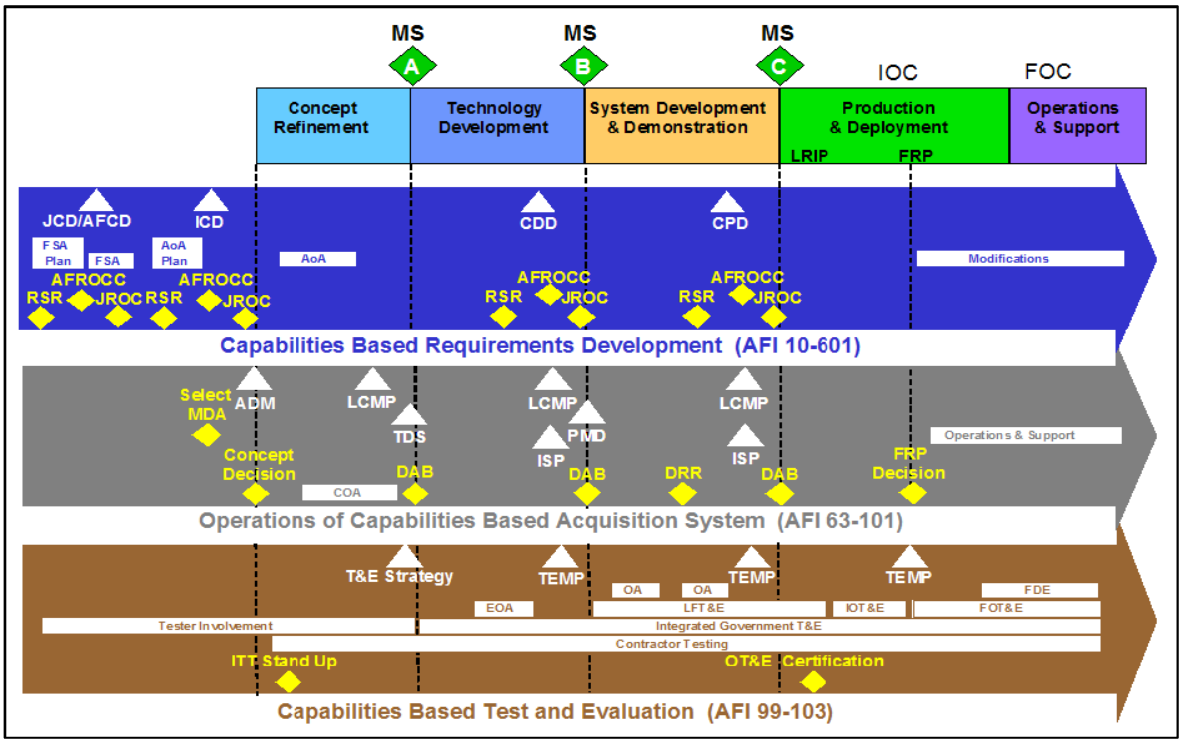



**Figure 4-10. JCIDS Process (5:11)**

To start the JCIDS process, AFCYBER as the capability sponsor must prepare an Air Force Capabilities Document (AFCD), based upon a Functional Area Analysis (FAA) and a Functional Needs Analysis (FNA), which identifies what capability is required to accomplish the mission and any existing gaps/shortfalls or redundancies (5:12). AFCYBER presents the AFCD to the Air Force Requirements for Operational Capabilities Council (AFROCC) for approval (5:27). The approved AFCD provides a baseline for the Functional Solution Analysis (FSA) leading to the development of an Initial Capabilities Document (ICD) (5:12). AFCYBER then presents the ICD to the AFROCC for approval (5:14). The ICD summarizes the analyses and identifies one or more approaches (materiel and non-materiel) that may deliver the required capability

(5:27). The outcome of an ICD could be one or more DOTMLPF Change Recommendations (DCRs) for a primarily non-materiel solution or Capability Development Documents (CDDs) for a primarily materiel solution (5:27).

For the primarily non-materiel solution, the JCIDS process continues with AFCYBER developing the requirements strategy to lay the foundation for developing the DCR (5:41). Once AF/A5R completes the Requirements Strategy Review (RSR), AFCYBER can initiate the DCR. The DCR focuses on transformation efforts in areas of DOTMLPF and policy (5:41). AFCYBER presents the DCR to the AFROCC for approval (5:42). If the DCR is AF-specific, AFROCC is the final approver. If the DCR has joint applicability, the Joint Requirements Oversight Council (JROC) is the final approver (5:42). Both the Joint DCR and AF-specific DCR have a goal for implementation of less than 18 months from date of approval (5:41).

For the primarily materiel solution, JCIDS has Acquisition Decision Milestones A, B and C that must be made before declaring IOC and FOC (5:11). When AFCYBER presents the ICD to the AFROCC for approval that requires a materiel solution, there may be a requirement for an Analysis of Alternatives (AoA) and Concept Refinement (5:28). Milestone A is achieved when the Milestone Decision Authority (MDA) agrees to and documents AFCYBER's preferred solution to fulfill the capability need (5:28).

The next phase begins with AFCYBER developing the requirements strategy to lay the foundation for developing the CDD (5:31). Once AF/A5R completes the RSR, AFCYBER can initiate the CDD. The CDD provides

performance and support-related attributes, including Key Performance Parameters (KPPs) and Key System Attributes (KSAs) (5:32). AFCYBER presents the CDD to the AFROCC for approval. Before milestone B, the MDA may require a new or updated AoA (5:32). Milestone B is achieved when the MDA agrees to the approved CDD, which updates architectures and guides post-Milestone B activities (5:34).

To achieve Milestone C, AFCYBER starts by developing the requirements strategy to lay the foundation for developing the Capability Production Document (CPD) (5:36). Once AF/A5R completes the RSR, AFCYBER can initiate the CPD. The CPD provides firm, measurable, and testable requirements for the Production and Deployment Phase (5:37). It also refines the KPPs, KSAs, and other performance and support-related attributes approved in the CDD. AFCYBER presents the CPD to the AFROCC for approval (5:37). Before milestone C, the MDA may again require a new or updated AoA (5:37). Milestone C is achieved when the MDA agrees to the approved CPD, which updates architectures, initiates production actions and guides post-Milestone C activities (5:39).

Once Milestone C is reached, Integrated Test and Evaluation functions identify the capabilities and limitations of the delivered system, reduce risks, and work to resolve deficiencies as early as possible. The varying tests combine developmental and operational test objectives to ensure the delivered capability will satisfy operational mission requirements (5:9).

While it is difficult to assess the average time it takes for a new capability to complete the JCIDS process from start to finish, it may take a relatively long time for a cyber capability. According to a Joint Staff J8 briefing in February of 2006, the below JCIDS staffing timelines have been shortened (13:9):

- CDDs reduced from 255 days average to 158
- ICDs reduced from 353 days average to 181
- JROC Memorandums reduced from 43 days to 30 days

This implies that the average timeline to complete Milestone B could still take over a year, and then the Production and Deployment phase finally begins (5:11). To keep up with the dynamic cyber environment where, according to Moore's Law, computer technology doubles every 18 months, it appears that JCIDS would keep us at least one generation behind. But new software vulnerabilities are identified even more frequently. Microsoft releases new software updates to correct known vulnerabilities on the second Tuesday of every month, called *Patch Tuesday* (14:1). Also, Symantec reported that in the second half of 2007 it had documented 2,134 new vulnerabilities and determined that the window of exposure for enterprise vendors was 46 days (15:6). We can see that cyber exploit development needs to be measured in months at most, and possibly even weeks or days, but definitely not in years. JCIDS, or some other capability development process would need to be drastically shortened to keep up with the cyber hacking community.

There is a JCIDS option currently available to consider fielding an interim capability quickly. If there is a readily available system/tool and it meets the

specified criteria, the Warfighter Urgent Operational Needs (UON) process could be used to quickly field and operate an interim solution (5:64). AFI 10-601 Attachment 3 provides the details for the UON process. The UON process is shown in Figure 4-11.

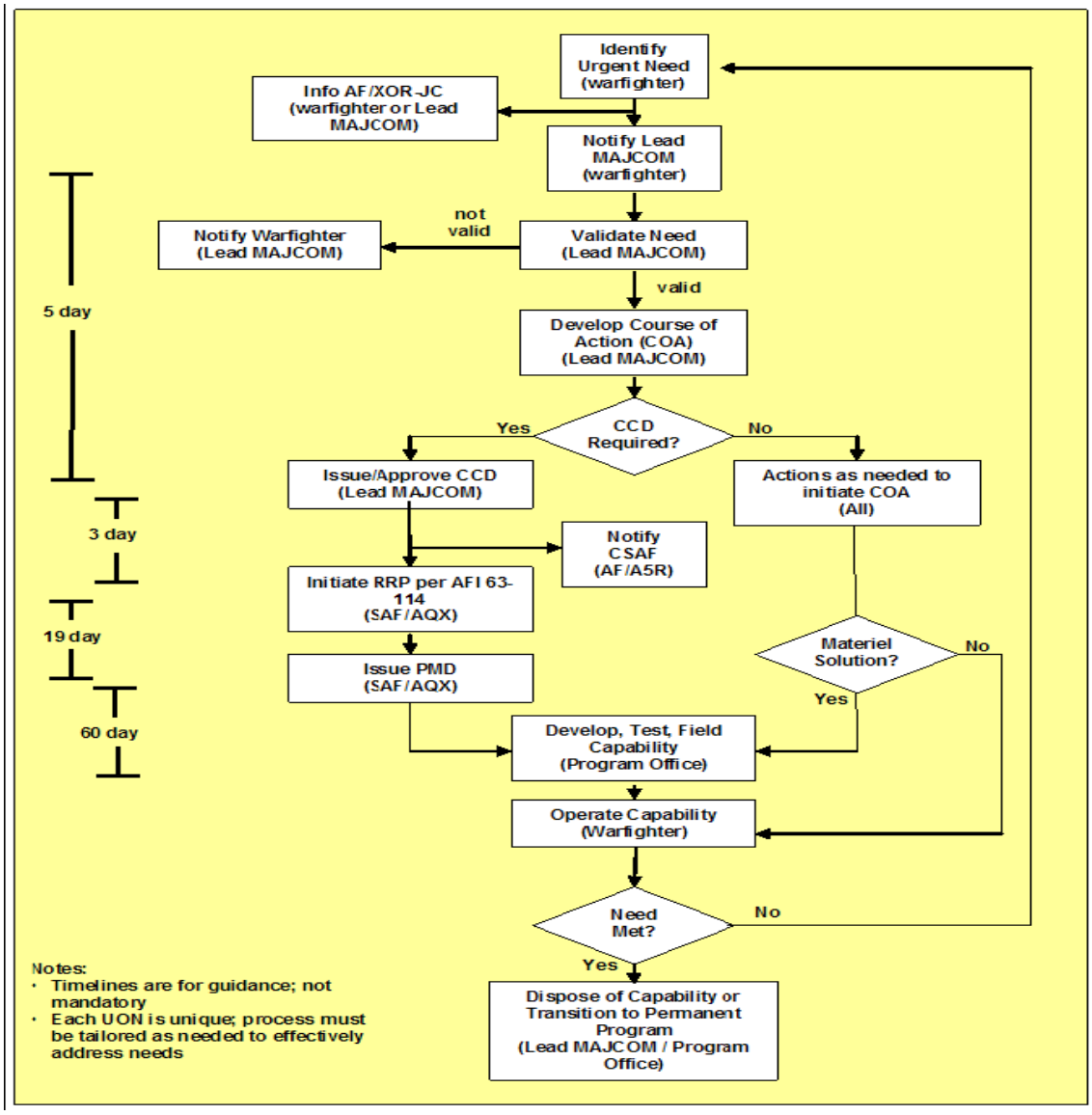



**Figure 4-11. Warfighter Urgent Operational Needs Process (5:65)**

A UON is typically identified during conflict or crisis situations that are life threatening or combat mission threatening (5:64). Depending on the situation, a

cyber capability may or may not meet this criterion. The process starts when a warfighting commander identifies a capability gap/shortfall that meets the UON criteria and requests Air Force assistance (5:65). For a cyber capability, the request should be sent to AFCYBER for UON validation. Once validated, AFCYBER has five days to develop a Course of Action to deliver the solution and advise the requestor and AF/A5 (5:66). Since there is no dedicated funding source for UONs, AFCYBER would be responsible for sourcing the funds and giving it priority over other requirements (5:67). AFCYBER is also responsible for working with applicable program offices to determine the appropriate acquisition, requirements, test, and evaluation strategies (5:68). If there is no existing requirement for the capability (e.g., approved CDD or CPD) and a new acquisition is required, a Combat Capability Document (CCD) may be required (5:68). A CCD is used by the Air Force in lieu of an ICD, CDD, and CPD to support fielding an interim solution for a warfighter's urgent need (5:68). A CCD and the Rapid Response Process (RRP) can only be used if: the capability can be fielded within approximately 60 days; it is supportable and sustainable with existing means; it is technically and technologically feasible; and a viable concept exists to field, provide training, employ, support and sustain (5:68-69). If the RRP is not possible, AFCYBER would have to follow the normal JCIDS process (5:68) to field the solution. In addition, if the solution is fielded using the RRP, AFCYBER would also have to follow-up with the required JCIDS documents (ICD, CDD, and CPD) for a long-term solution (5:70). As shown in Figure 4-10,

AFCYBER has three days to initiate the RRP after the CCD is approved, 19 days to complete the RRP, and 60 days to field the interim solution (5:65).

In reality, cyber capabilities may not meet the criteria for the UON or RRP processes. However, as stated earlier, new cyber capabilities will require faster development cycles than the normal JCIDS can support due to the rapid changes in cyber technology and software. This is an area that requires additional research to determine a rapid way to develop and field new cyber capabilities.

# V. Conclusions

Based upon the policy review, IOC and FOC are terms associated with the fielding of new capabilities developed using the JCIDS process. Unless cyber units are activated to field a new capability, IOC and FOC milestones should not be associated with their readiness reporting. Since there was no need to complete the JCIDS process to declare the 315th NWS ready for operations, SORTS reporting was the appropriate method to measure unit readiness to support wartime taskings.

The SORTS reporting of a new Air Force NWS should start with C-5 for unit activation, then C-3 for initial operations readiness, and finally C-1 to declare full wartime mission readiness. While basic information was provided in this report to compute SORTS readiness for an Air Force NWS, AFI 10-201 provides the details of measuring the personnel, equipment and training to determine the overall readiness rating (C-Level) of the unit. DRRS may eventually become the one DoD system to report all unit readiness data, but at the time of this research report, the published directives require units to report the different readiness measurements through the two different systems: SORTS is used for tactical-level unit readiness reporting to Service Departments in support of DOCS assigned missions, and DRRS will be used for operational-level unit readiness reporting to Unified Combatant Commands in support of joint mission essential tasks.

In the future, AFCYBER may need to develop and field a new cyber capability following the JCIDS process. Staffing the required documents and obtaining each Acquisition Decision Milestone may take a relatively long time to complete compared to current technology lifecycles. If a warfighting commander identifies a cyber capability shortfall that prevents mission accomplishment, the UON process could be used to quickly field and operate an interim cyber capability. However, new cyber capabilities may not meet this stringent UON criterion or the Rapid Response Process that enables using the faster timeline. More research is needed to determine the optimal way to develop and field new cyber capabilities, within JCIDS or another process, to gain the advantage in this new mission area to meet warfighter needs.

## Appendix A. 27th Fighter Squadron IOC Checklist

| Action Item Number | Short Title | *OPR* | Suspense |
|---|---|---|---|
| | **DO/CC Taskings** | | |
| DO-101 | Develop Operations Plan/Timeline to IOC | CC/DO | 1 Nov 05 |
| DO-102 | ATC Issues/coord IFR Waiver/IMC waiver (1500/3...similar to Tyndall) | CC/DO | 1 Jan 05 |
| DO-103 | Justification for Casual Lt's (Prefer 2) | CC/DO | 15 Nov 04 |
| DO-104 | CC/DO Policy Letters Signed (All Shops) | CC/DO | 15 Dec 05 |
| DO-105 | Assign Jobs/Additional Duties | CC/DO | 1 Nov 04 |
| | **CSS Taskings** | | |
| CCA-101 | Establish O'room Duties | CSS | 1 Dec 04 |
| CCA-102 | Additional Duties Listing/Tracking | CSS | 15 Nov 04 |
| CCA-103 | Recall Roster | CSS | 8 Oct 04 |
| CCA-104 | Social Roster | CSS | 8 Oct 04 |
| CCA-105 | Ancillary Training Tracker with Plans/Mobility | CSS | 1 Nov 04 |
| CCA-106 | Sponsor Program –Updated | CSS | 15 Nov 04 |
| CCA-107 | OPR/EPR/PRF Unit Mission Description | CSS | 1 Dec 04 |
| CCA-108 | OPR/EPR/PRF Job Descriptions | CSS | 1 Dec 04 |
| CCA-109 | Update and submit CC/DO Policy Letters | CSS | 1 Dec 04 |
| CCA-110 | Submit Deployment Packing List to Mobility | CSS | 1 May 05 |
| CCA-111 | Build Continuity Book | CSS | 1 May 05 |
| CCA-112 | Quarterly Awards Package Shells Built | CSS | 15 Dec 04 |
| | **STAN EVAL** | | |
| Stan-101 | IFG Supplements (TOLD/Diverts/ EP Guide/ Security Requirements) | Wing Stan Eval | 1 Jan 05 |
| Stan-102 | Regulations (Chap 8, etc.) | Wing Stan Eval | 1 Jan 05 |
| Stan-103 | Dual Qual Letter Submitted for Approval | Wing Stan Eval w/ACC/DOTO | 15 Nov 04 |
| Stan-104 | Build TOLD Charts for Duty Desk | Wing Stan Eval | 15 Jan 05 |
| Stan-105 | Develop a plan for diverted A/C (Security of A/C; products, etc.) | Wing Stan Eval | 15 Jan 05 |
| Stan-106 | MQF Development | Wing Stan Eval | 15 Jan 05 |
| Stan-107 | Open/Closed/IRC Tests | Wing Stan Eval | 15 Jan 05 |
| Stan-108 | Line-up Cards | Wing Stan Eval | 15 Jan 05 |
| Stan-109 | EP of the day listing | Wing Stan Eval | 1 Jan 05 |
| Stan-110 | SII's F/A-22 specific | Wing Stan Eval | 1 Jan 05 |
| Stan-111 | Plan to update Flight manuals (Safety Sups, Read File, E-checklist, IMIS) | Wing Stan Eval | 1 Jan 05 |
| Stan-112 | ATC Coordination for Local Area Operations (Airspace, Tower, etc) | Wing Stan Eval | 1 Jan 05 |
| Stan-113 | Submit New Callsigns for Approval | Wing Stan Eval | 15 Nov 04 |
| Stan-114 | Runway Closure Gameplan (June) w27th CC | Wing Stan Eval | 1 Feb 05 |
| Stan-115 | SEFE letter (approval process) Waiver to | Wing Stan Eval | 1 Feb 05 |

| Action Item Number | Short Title | *OPR* | Suspense |
|---|---|---|---|
| | Inst/Qual check in SIM (talk to Tyndall) | | |
| Stan-116 | FEF File/Tracking | Wing Stan Eval | 15 Dec 04 |
| Stan-117 | Briefing Rooms Set-up Pubs/Boards/Brf Guides (Unclass Section)/Security Requirements | Stan Eval | 1 Jan 04 |
| Stan-118 | Display Magnets and Raptor Sticks for Briefing Rooms | Stan Eval | 15 Dec 04 |
| Stan-119 | Board for tracking Checkride Zones and Prerequisites | Stan Eval | 15 Feb 05 |
| Stan-120 | SEPT Guide | Stan Eval | 15 Jan 05 |
| Stan-121 | Update and submit CC/DO Policy Letters | Stan Eval | 1 Dec 04 |
| Stan-122 | Build Continuity Book | Stan Eval | 1 May 05 |
| Stan-123 | Submit Deployment Packing List to Mobility | Stan Eval | 1 May 05 |
| | **CURRENT OPS** | | |
| OSO-101 | Develop a plan for Airspace (General, exclusive, concurrent use, etc.) | OSO | 15 Jan 05 |
| OSO-102 | Memo of Agreement for use of Airspace Above 50K feet | OSO | 15 Jan 05 |
| OSO-103 | Develop a plan for Air-to-Ground Range/Airspace availability (JDAM requirements, release outside of range boundary, etc.) | OSO | 1 May 05 |
| OSO-104 | Coordinate for F-15 support (DACT) Long Range Plan | OSO | 1 Apr 05 |
| | **Training** | | |
| Trg-101 | Update and Maintain Syllabus (work w/wing weapons to build original) | Wing Training | 15 Feb 05 |
| Trg-102 | Gradesheets | Wing Training | 1 Mar 05 |
| Trg-103 | Letter X's (qualification listing) | Wing Training | 15 Jan 05 |
| Trg-104 | Training documentation (letters enrolling and completing training) | Wing Training | 1 Mar 05 |
| Trg-105 | Convert AFORMS and TAR Sheets | Wing Training | 1 Jan 05 |
| Trg-106 | RAP Requirements (ACC Reg) | Wing Training | 1 Jan 05 |
| Trg-107 | Update RAP Calculator for F/A-22 Ops | Wing Training | 1 Jan 05 |
| Trg-108 | Coordinate SOF Plan & Requirements (Conference Hotel, etc.) | Wing Training | 1 Jan 05 |
| Trg-109 | Brief all SOF's on procedures for combined F-15 and F/A-22 operations | Wing Training | 1 Jan 05 |
| Trg-110 | Build a Simulator Operational Timeline (handoff form I/O office, issues, furniture, etc.) | Wing Training | 15 Dec 04 |
| Trg-111 | Non-CMR Letters according to ACC Reg | Training | 15 Jan 05 |
| Trg-112 | Update and submit CC/DO Policy Letters | Training | 1 Dec 04 |
| Trg-113 | Submit Deployment Packing List to Mobility | Training | 1 May 05 |
| Trg-114 | Process to track training (Build and post board) | Training | 15 Mar 04 |
| Trg-115 | Gradebooks (Example Built) | Training | 15 Mar 05 |
| Trg-116 | Build Continuity Book | Training | 1 May 05 |

| Action Item Number | Short Title | *OPR* | Suspense |
|---|---|---|---|
| | **Weapons/ASM** | | |
| Wp-101 | Training Plan to IOC | Weapons | 15 Feb 05 |
| Wp-102 | Build Phase Briefings | Weapons | 1 Mar 05 |
| Wp-103 | Work with Nellis for Classified Briefing Guides and place in all Briefing Rooms | Weapons | 15 Jan 05 |
| Wp-104 | Standards Admin/Tactical (Coordinate with Tyndall and Nellis to standardize within the Raptor community) | Weapons | 15 Jan 05 |
| Wp-105 | Syllabus Development | Weapons | 15 Feb 04 |
| Wp-106 | AFMSS (Standard load built and input) | Weapons | 15 Jan 05 |
| Wp-107 | Set-up WTT Training | Weapons | 15 Nov 04 |
| Wp-108 | Scenario development | Weapons | 1 Mar 05 |
| Wp-109 | ET Plan | Weapons | 15 Jan 05 |
| Wp-110 | Weapons Loadout Coordinated w/maintenance (Chaff/Flare/Aim-9s/Aim-120s, JDAMs) | Weapons | 1 Dec 04 |
| Wp-111 | ODS Setup & Archive Plan & Setup | Derick H/Weapons | 1 Dec 04 |
| Wp-112 | Develop SCLs (work with Scheduling) | Weapons | 15 Dec 04 |
| Wp-113 | 8mm Debrief Capability | Weapons | 15 Jan 05 |
| Wp-114 | Academic Training Plan | Weapons | 1 Mar 05 |
| Wp-115 | Top Gun Program | Weapons | 1 Jul 05 |
| Wp-116 | Read File | Weapons | 15 Jan 05 |
| Wp-117 | Build Library…Pubs (3-1, 3-3, etc.) | Weapons | 1 Jan 05 |
| Wp-118 | ACS trip POC and Plan (Long-range) | Weapons | 1 Dec 04 |
| Wp-119 | P-5 Capability | Weapons | 1Apr 05 |
| Wp-120 | Shot Logs positioned in vault | Weapons | 15 Jan 05 |
| Wp-121 | Update and submit CC/DO Policy Letters | Weapons | 1 Dec 04 |
| Wp-122 | Live Weapons Storage and Requirements | Weapons | 1 Jan 05 |
| Wp-123 | Order Weapons | Weapons | 15 Jan 05 |
| Wp-124 | Submit Deployment Packing List to Mobility | Weapons | 1 May 05 |
| Wp-125 | Build Continuity Book | Weapons | 1 Jun 05 |
| Wp-126 | Real World Taskings –integration into Battle Staff | Weapons | 1 May O5 |
| Wp-127 | Security CONOPS/plan (Develop and post Vault procedures) | Wing ASM | 15 Nov 04 |
| Wp-128 | Set up Safe for Micro DTCs and VDCs | ASM | 15 Dec 04 |
| Wp-129 | Develop plan for maintenance/pilot Micro DTC swap-out in debrief (Policy Letter) | ASM | 1 Jan 05 |
| Wp-130 | IMIS Input Sheets (Coordinate with maintenance for procedures to have pilots input prior to their first flight) | ASM | 1 Jan 05 |
| Wp-131 | Clearance update procedures | ASM | 1 Feb 05 |
| Wp-132 | STE (2 Secret 1 TS/SCI) (Work with Intel) | ASM | 1 Jan 05 |
| Wp-133 | Develop Vault Inventory Procedures | ASM | 1 Dec 04 |
| Wp-134 | Develop a plan for coordinating clearances to take photos on the flightline | ASM | 1 Dec 04 |

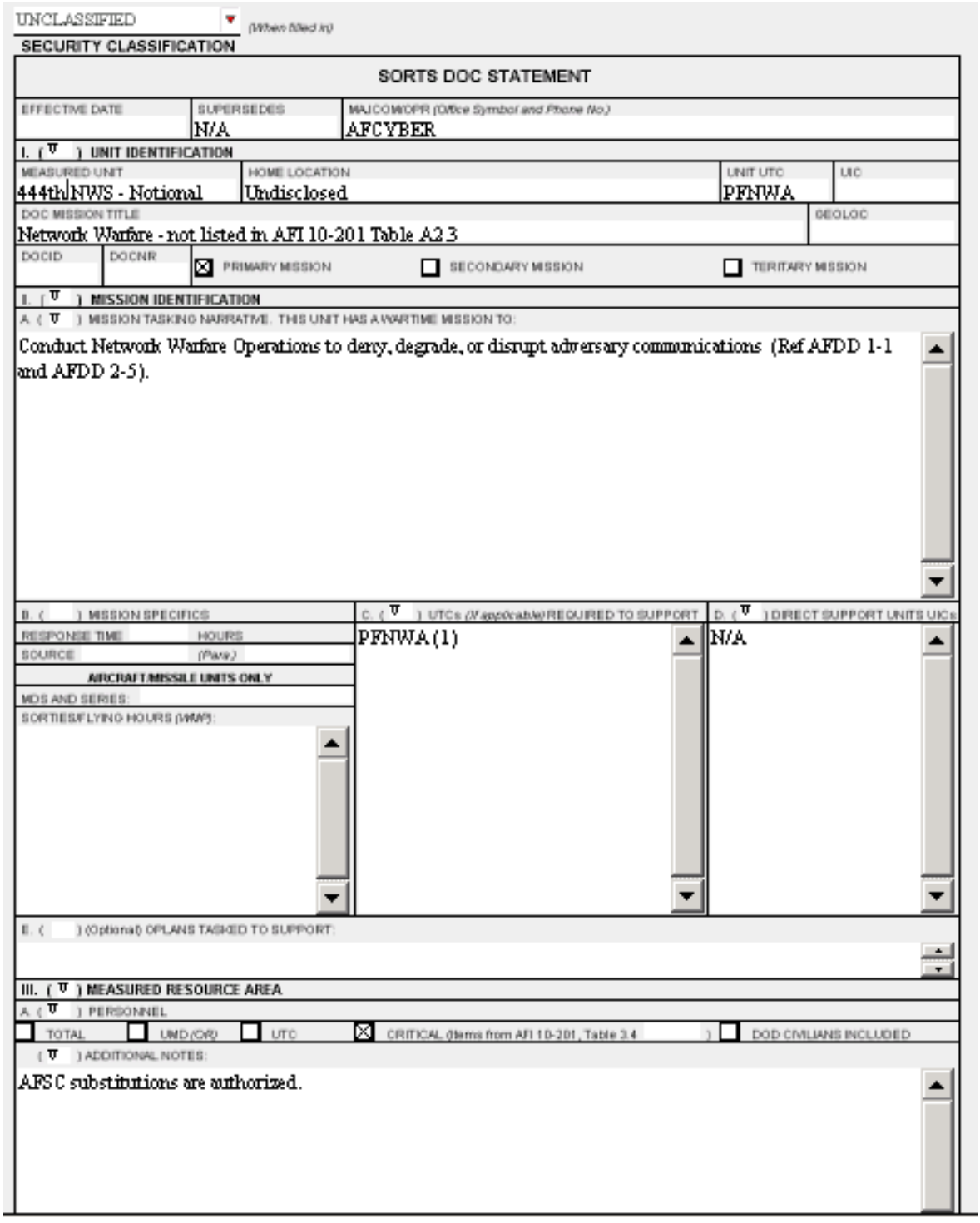
| Action Item Number | Short Title | *OPR* | Suspense |
|---|---|---|---|
| | and/or in the hanger | | |
| Wp-135 | Vault Accessibility (Doorbell) | F/A-22 I/O | 15 Dec 04 |
| Wp-136 | White Noise | F/A-22 I/O | 15 Nov 04 |
| Wp-137 | Develop plan to ensure clearances granted prior to training for all inbounds; Security Brfs Format (smartboard/TV) | F/A-22 I/O | 1 Jan 05 |
| Wp-138 | Minimum 3 computers with SPAWN D, 1 FIRM Y, and 1 JNET-C in the Vault | F/A-22 I/O | 1 Jan 05 |
| Wp-139 | Procedures in place for Un-cleared Visitors into F/A-22 Sim | F/A-22 I/O w/ACC/DR-22 | 15 Dec 04 |
| | **Mobility Officer/Plans** | | |
| Plan-101 | Hurevac Plan | Wing XP | 1 Jan 05 |
| Plan-102 | Combat Plans | Wing XP | 15 Apr 05 |
| MOB-103 | Order ISU70's (3) | Wing MOB | 1 Aug 05 |
| MOB-104 | Mobility Ops (UDM; deployable vaults/tortoise) | MOB | 15 Apr 05 |
| MOB-105 | Mobility Folders | MOB | 1 Nov 04 |
| MOB-106 | ISU/UTC Plan | MOB | 15 Apr 05 |
| MOB-107 | Packing List for all Shops (POC) | MOB | 15 Apr 05 |
| MOB-108 | Update and submit CC/DO Policy Letters | MOB | 1 Dec 04 |
| MOB-109 | Deployment Packing List | MOB | 1 May 05 |
| MOB-110 | Build Continuity Book | MOB | 1 May 05 |
| MOB-111 | Ancillary Training Tracker with 1 CO's | MOB | 15 Nov 04 |
| | SCHEDULING/MLO | | |
| Sch-101 | FHP (TASAMS Training) | Scheduling | 1 Jan 05 |
| Sch-102 | Make Pucks for Scheduling Boards | Scheduling | 15 Dec 04 |
| Sch-103 | Standard Meeting Schedule on Boards | Scheduling | 1 Nov 04 |
| Sch-104 | Mnx Mtg coordination of short and long term scheduling | Scheduling | 1 Jan 05 |
| Sch-105 | Update and submit CC/DO Policy Letters | Scheduling | 1 Dec 04 |
| Sch-106 | Submit Deployment Packing List to Mobility | Scheduling | 1 May 05 |
| Sch-107 | Build Continuity Book | Scheduling | 1 May 05 |
| | INTELLIGENCE | | |
| Intel-101 | CIB briefs | Wing Intel | 1 Jan 05 |
| Intel-102 | F/A-22 capes briefings-Secret, Secret No Forn, (Approved by DO or CC) | Wing Intel | 1 Jan 05 |
| Intel-103 | F/A-22 capes briefings-Unclassified (Approved by DO or CC) | Wing Intel | 15 Nov 04 |
| Intel-104 | Threat briefs | Wing Intel | 1 Jan 05 |
| Intel-105 | Get OSS Vault Accreditation | Wing Intel | 1 Apr 05 |
| Intel-106 | Develop Air-to-Air MQF | Wing Intel | 15 Jan 05 |
| Intel-107 | Develop Air-to-Ground MQF | Wing Intel | 15 Apr 05 |
| Intel-108 | SCI Requirements and Procedures (Coord with ASM) | Wing Intel | 1 Jan 05 |
| Intel-109 | Outside Main Briefing room security procedures/checklist | Wing Intel | 1 Dec 04 |
| Intel-110 | Build Targeting Brief for pilot training | Wing Intel | 1 Apr 05 |
| Intel-111 | Ensure Raindrop availability in 27th vault | Wing Intel | 1 Mar 05 |

| Action Item Number | Short Title | *OPR* | Suspense |
|---|---|---|---|
| Intel-112 | Assign POC for TDS work with Eglin EWG | Wing Intel | 1 Dec 04 |
| Intel-113 | JAWS installed on Computers | Wing Intel | 1 Apr 05 |
| Intel-114 | Mission Operation Area (MOA), targeting packages/folders | Wing Intel | 1 Jun 05 |
| Intel-115 | Intel Formal Training Plan (IFTU), CTC, etc. | Wing Intel | 1 Jan 05 |
| Intel-116 | Create annual training requirements/plan | Wing Intel | 1 Jan 05 |
| Intel-117 | JWICS integration/clearance procedures | Wing Intel | 1 Mar 05 |
| Intel-118 | SIPRNET (w/ASM) | Intel | 1 Dec 04 |
| Intel-119 | Vault connectivity (w/ASM) | Intel | 1 Dec 04 |
| Intel-120 | Classified Pubs | Intel | 15 Dec 04 |
| Intel-121 | Isopreps | Intel | 1 Jan 05 |
| Intel-122 | Create Intel ADPE account | Intel | 1 Dec 04 |
| Intel-123 | Update and submit CC/DO Policy Letters | Intel | 1 Dec 04 |
| Intel-124 | Submit Deployment Packing List to Mobility | Intel | 1 May 05 |
| Intel-125 | Build Continuity Book | Intel | 1 May 05 |
| | SAFETY | | |
| Saf-101 | Attend Safety Course (27th Pilot 2-27 May Class) | Wing Safety | 1 Jun 05 |
| Saf-102 | F/A-22 specific safety requirements | Wing Safety | 15 Dec 04 |
| Saf-103 | Fire Dept extraction training | Wing Safety | 1 Jan 05 |
| Saf-104 | Procedures for F/A-22 incidents (Policy letter for Emergency Notification Procedures…Who and Timeline) | Wing Safety | 1 Jan 05 |
| Saf-105 | EOR requirements | Wing Safety | 15 Dec 04 |
| Saf-106 | Wing Safety Personnel F/A-22 FAM Training | Wing Safety | 1 Jan 05 |
| Saf-107 | Quantify CRM difference/requirements | Wing Safety | 1 Jan 05 |
| Saf-108 | Bioenvironmental coordination for HAZMAT | Wing Safety | 1 Jan 05 |
| Saf-109 | Update and submit CC/DO Policy Letters | Safety | 1 Dec 04 |
| Saf-110 | Submit Deployment Packing List to Mobility | Safety | 1 May 05 |
| Saf-111 | Safety Rep designated with required training | Safety | 15 Nov 04 |
| Saf-112 | Build Continuity Book | Safety | 1 May 05 |
| | LIFE SUPPORT OFFICER | | |
| Life-101 | Check out initial cadre and Wing Life Support Officer to teach egress | Wing Life Sup | 1 Feb 05 |
| Life-102 | Establish Inventory for Seat Kit Requirements | Wing Life Sup | 1 Jan 05 |
| Life-103 | Develop Program to Tracking Training | Wing Life Sup | 1 Jan 05 |
| Life-104 | Plan for Survival Vest | Wing Life Sup | 1 Jan 05 |
| Life-105 | LPU plan/delivery timeline (Minimum 3 by Jan if specific requirement for Raptor) | Wing Life Sup | 1 Jan 05 |
| Life-106 | Decon Procedures | Wing Life Sup | 1 May 05 |
| Life-107 | Ensure a plan for G-suits | Wing Life Sup | 1 Jan 05 |
| Life-108 | Develop a plan for survival vest | Wing Life Sup | 1 May 05 |

| Action Item Number | Short Title | *OPR* | Suspense |
|---|---|---|---|
| | equipment/content requirements for real world tasking | | |
| Life-109 | Research and produce an NVG vs PNVG cost/feasibility analysis | Life Support | 1 Dec 04 |
| Life-110 | Nametags on Flight Gear Lockers and plan for follow-on Inbounds | Life Support | 15 Nov 04 |
| Life-111 | Nametags on Shower Room Lockers and plan for follow-on Inbounds | Life Support | 15 Nov 04 |
| Life-112 | Acquire Poopy Suit for spares | Life Support | 1 Jan 05 |
| Life-113 | NVG Dark room Plan | Life Support | 15 Jan 05 |
| Life-114 | AERPs Gear Inventory | Life Support | 1 May 05 |
| Life-115 | Update and submit CC/DO Policy Letters | Life Support | 1 Dec 04 |
| Life-116 | All Life Support Personnel trained on F/A-22 equipment | Life Support | 1 Jan 05 |
| Life-117 | Submit Deployment Packing List to Mobility | Life Support | 1 May 05 |
| Life-118 | Build Continuity Book | Life Support | 1 May 05 |
| Life-119 | Part Task Trainer for Egress | F/A-22 I/O | 1 Jan 05 |
| | SNACKO | | |
| Snack-101 | Develop a Financial Plan | Snacko | 1 Nov 04 |
| Snack-102 | Get a plan for Coffee | Snacko | 1 Nov 04 |
| Snack-103 | Order T-shirts | Snacko | 1 Dec 04 |
| Snack-104 | Order Scarves | Snacko | 15 Nov 04 |
| Snack-105 | Order Polo Shirts | Snacko | 1 Jan 04 |
| Snack-106 | Order Mugs | Snacko | 15 Nov 04 |
| Snack-107 | Baseball hats (If we decide we want them) | Snacko | 1 Mar 05 |
| Snack-108 | Order Coins | Snacko | 15 Dec 04 |
| Snack-109 | Develop a plan for Going away plaques/gifts/photos | Snacko | 1 May 05 |
| Snack-110 | Research Slushy Machine Options | Snacko | 1 Jan 05 |
| Snack-111 | Acquire Popcorn Machine | Snacko | NOW! |
| Snack-112 | Complete Heritage Room | Snacko | ASAP |
| Snack-113 | Update and submit CC/DO Policy Letters | Snacko | 1 Dec 04 |
| Snack-114 | Submit Deployment Packing List to Mobility | Snacko | 1 May 05 |
| Snack-115 | Build Continuity Book | Snacko | 1 May 05 |
| Snack-116 | Mass Briefing Room Plaques Hung | Snacko | 15 Nov 04 |
| Snack-117 | Secure Inventory prior to Air Show | Snacko | 1 Apr 05 |
| | AVIATION RESOURCE | | |
| 1CO-101 | Process to Post Daily Schedule | 1CO's | 15 Oct 04 |
| 1CO-102 | Complete Pubs Library | 1CO's | 15 Dec 04 |
| 1CO-103 | Coordinate Pubs process (work with Stan Eval) | 1CO's | 15 Nov 04 |
| 1CO-104 | Sign out currency procedures/Auditing/ etc (Computer Based…see Tyndall or Edwards example) weekly MQF Test (work with Stan Eval) | 1CO's | 15 Dec 04 |
| 1CO-105 | Complete Radio Set-up | 1 CO's | 15 Nov 04 |
| 1CO-106 | Develop plan to ensure pilots have | 1CO's | 15 Dec 04 |

| Action Item Number | Short Title | *OPR* | Suspense |
|---|---|---|---|
| | visibility to schedule from off-station (website and answering machine) | | |
| 1CO-107 | Design New Printed Schedule Format | 1 CO's | 15 Jan 05 |
| 1 CO-108 | Mass Briefing Slide Shell built | 1CO's | 1 May 05 |
| 1 CO-109 | Complete Duty Desk setup | 1 CO's | 15 Nov 04 |
| 1 CO-110 | Plasma Screens installed and running | 1 CO's | 15 Nov 04 |
| 1 CO-111 | Display Board with pictures for 27th FS Members | 1 CO's | 1 Dec 04 |
| 1 CO-112 | Display Board for Award Recipients | 1 CO's | 1 Dec 04 |
| 1 CO-113 | Update and submit CC/DO Policy Letters | 1 CO's | 1 Dec 04 |
| 1 CO-114 | Submit Deployment Packing List to Mobility | 1 CO's | 1 May 05 |
| 1 CO-115 | Build Continuity Book | 1 CO's | 1 May 05 |
| 1 CO-116 | A/C tracking device (A/C specific; Margins; IMIS Debrief info) for pilot visibility at duty desk | 1 CO's | 1 Jan 05 |
| 1 CO-117 | Coord with OSS for FHP tracking/auditing | 1 CO's | 1 Jan 05 |
| 1 CO-118 | Process to provide DO FHP info daily | 1CO's | 1 Dec 04 |
| | WORKGROUP MANAGER | | |
| Work-101 | 27 FS Website up to date | Workgroup mgt | 1 Dec 04 |
| Work-102 | Color Printer accessibility | Workgroup mgt | 20 Oct 04 |
| Work-103 | All Computers set-up and Networked | Workgroup mgt | 1 Nov 04 |
| Work-104 | Top-3 Checklist, family website | Workgroup mgt | 1 Jan 05 |
| Work-105 | Update and submit CC/DO Policy Letters | Workgroup mgt | |
| Work-106 | Build Continuity Book | Workgroup mgt | 1 May 05 |
| Work-107 | Connectivity and Briefing Capability in Mass Briefing Room | Workgroup mgt | 15 Nov 04 |
| | AIRFIELD OPS | | |
| AFO-101 | Parking Plan | OSA | 1 Jan 05 |
| AFO-102 | Shelter Plan | OSA | 1 Jan 05 |
| AFO-103 | Research Mid-field Cable Feasibility | OSA | 1 Feb 05 |
| AFO-104 | Transitional Area Waiver | OSA | 1 Jan 05 |
| | HISTORIAN/PA | | |
| Hist-101 | List of "first" accomplished and listing of accomplishments | CCA | 1 Jun 05 |

## Appendix B. Sample DOC Statement



UNCLASSIFIED (When filled in)

SECURITY CLASSIFICATION

**SORTS DOC STATEMENT**

| EFFECTIVE DATE | SUPERSEDES | MAJCOM/OPR (Office Symbol and Phone No.) |
|---|---|---|
| | N/A | AFCYBER |

I. ( ▽ ) UNIT IDENTIFICATION

| MEASURED UNIT | HOME LOCATION | UNIT UTC | UIC |
|---|---|---|---|
| 444th NWS - Notional | Undisclosed | PFNWA | |

| DOC MISSION TITLE | GEOLOC |
|---|---|
| Network Warfare - not listed in AFI 10-201 Table A2.3 | |

| DOCID | DOCNR | ☒ PRIMARY MISSION | ☐ SECONDARY MISSION | ☐ TERITARY MISSION |
|---|---|---|---|---|
| | | | | |

II. ( ▽ ) MISSION IDENTIFICATION

A. ( ▽ ) MISSION TASKING NARRATIVE: THIS UNIT HAS A WARTIME MISSION TO:

Conduct Network Warfare Operations to deny, degrade, or disrupt adversary communications (Ref AFDD 1-1 and AFDD 2-5).

| B. ( ) MISSION SPECIFICS | C. ( ▽ ) UTCs (If applicable) REQUIRED TO SUPPORT | D. ( ▽ ) DIRECT SUPPORT UNITS UICs |
|---|---|---|
| RESPONSE TIME: HOURS | PFNWA (1) | N/A |
| SOURCE: (Plans) | | |
| AIRCRAFT/MISSILE UNITS ONLY | | |
| MDS AND SERIES: | | |
| SORTIES/FLYING HOURS (MWP): | | |

E. ( ) (Optional) OPLANS TASKED TO SUPPORT:

III. ( ▽ ) MEASURED RESOURCE AREA

A. ( ▽ ) PERSONNEL

☐ TOTAL ☐ UND/CVR ☐ UTC ☒ CRITICAL (Items from AFI 10-201, Table 3.4 ) ☐ DOD CIVILIANS INCLUDED

( ▽ ) ADDITIONAL NOTES:

AFSC substitutions are authorized.

UNCLASSIFIED *(When filled in)*

**SECURITY CLASSIFICATION**

**III. ( U ) MEASURED RESOURCE AREA *(Continued)***

B. ( U ) EQUIPMENT AND SUPPLIES ON HAND

| COMBAT ESSENTIAL | SUPPORT EQUIPMENT |
|---|---|
| ESSA2 | ESSA6 |

( U ) ADDITIONAL NOTES

N/A

C. ( U ) EQUIPMENT CONDITION

| COMBAT ESSENTIAL | SUPPORT EQUIPMENT AND SUPPLIES |
|---|---|
| Same as IIIB | Same as IIIB |

( U ) ADDITIONAL NOTES

N/A

UNCLASSIFIED *(When filled in)*

**SECURITY CLASSIFICATION**

| III. ( U ) MEASURED RESOURCE AREA *(Continued)* | | | | | | |
|---|---|---|---|---|---|---|
| D. ( U ) TRAINING | | | | | | |
| METHOD B: | ☐ CREW TRAINING | METHOD C: | ☒ OPTION 1 | ☐ UNIT TRAINING | ☐ OPTION 2 - | COMBAT AIR FORCES AVIATION TRAINING |

( U ) ADDITIONAL NOTES

1. IAW AFI 10-201 Table 6.1 Rule 11.

2. Once personnel achieve position certification, they are considered qualified.

3. Measure only personnel who execute/perform wartime mission.

**IV ( U ) AMPLIFLYING NOTES** *(As required)*

N/A

| V. ( ) GAINING COMMAND(S) | | |
|---|---|---|
| A. | B. | C. |
| D. | E. | F. |

| VI. ( ) COORDINATION/REVIEW | | | | | |
|---|---|---|---|---|---|
| MAJCOM COORDINATION | | | | | |
| MAJCOM COORDINATION | | | | | |
| MAJCOM COORDINATION | | | | | |
| MAJCOM COORDINATION | | | | | |
| MAJCOM COORDINATION | | | | | |
| MAJCOM APPROVAL | | | | DATE OF MAJCOM APPROVAL | |
| UNIT COMMANDER REVIEW | | | | | |
| UNIT COMMANDER REVIEW | | | | | |
| MAJCOM ANNUAL REVIEW | | | | | |
| MAJCOM ANNUAL REVIEW | | | | | |
| GAINING COMMAND (s) | | | | | |

## Bibliography


1. Department of Defense. *Chairman's Readiness System (CRS).* CJCSI 3401.01D. Washington: GPO. 10 December 2004.

2. Department of Defense*. Department of Defense Dictionary of Military and Associated Terms*. JP 1-02. Washington: GPO. 12 April 2001 (As amended through 4 March 2008).

3. Department of Defense. *Joint Capabilities Integration and Development System (JCIDS)*. CJCSI 3170.01F. Washington: GPO. 1 May 2007.

4. Department of Defense. *Operation of the Joint Capabilities Integration and Development System (JCIDS)*. CJCSM 3170.01C. Washington: GPO. 1 May 2007.

5. Department of the Air Force. *Capabilities Based Requirements Development.* AFI 10-601. Washington: HQ USAF. 31 July 2006.

6. Department of the Air Force. *Implementation of the Secretary of the Air Force Direction to Establish Air Force Cyberspace Command (AFCYBER)*. Program Action Directive 07-08, Change 1. Washington: HQ USAF. 24 January 2008.

7. Department of the Air Force. *Readiness*. AFPD 10-2. Washington: HQ USAF. 30 October 2006.

8. Department of the Air Force. *Status of Resources and Training System*. AFI 10-201. Washington: HQ USAF. 13 April 2006.

9. Haugh, Timothy D. Commander, 315th NWS. "RE: 11 IS IOC Criteria." SECRET Electronic Mail. 4 February 2008.

10. Haugh, Timothy D. Commander, 315th NWS. "RE: GRP Initial Assessment." Electronic Mail. 22 February 2008.

11. Haugh, Timothy D. Commander, 315th NWS. "RE: Meeting Friday." Electronic Mail. 16 October 2007.

12. Headquarters Air Force Space Command. *Declaration of Initial Operational Capability (IOC) and Full Operational Capability (FOC)*. AFSPCI 10-601. 2 December 1997.

13. Joint Staff J8. *Joint Capabilities Integration and Development System (JCIDS): Delivering Joint Capabilities to the Warfighter.* PowerPoint Briefing. 01 February 2006

14. Microsoft. *Microsoft Security Bulletin Advance Notification.* Microsoft TechNet Website. Accessed 23 May 2008. http://www.microsoft.com/technet/security/bulletin/advance.mspx

15. Symantec. *Symantec Global Internet Security Threat Report. Trends for July–December 07Volume XII, Published April 2008.* Symantec Business Website. Accessed 23 May 2008. http://eval.symantec.com/mktginfo/enterprise/white_papers/b-whitepaper_internet_security_threat_report_xiii_04-2008.en-us.pdf

16. Tolliver, Wade G. Commander, 27th Fighter Squadron. "RE: AFIT student looking for some help regarding IOC/FOC." Electronic Mail. 1 February 2008.

17. Tolliver, Wade G. Commander, 27th Fighter Squadron. "RE: AFIT student looking for some help regarding IOC/FOC." Electronic Mail. 3 February 2008

# Vita

Major Paul Orth enlisted in the U.S. Air Force in 1987 as an Air Traffic Controller and, while on active duty, completed his undergraduate Bachelor of Science degree in Professional Aeronautics from Embry-Riddle Aeronautical University in 1993. He received his commission from Officer Training School in 1994 where he was recognized as a Distinguished Graduate.

Major Orth was first assigned as a Communications Officer to the 4th Space Operations Squadron at Falcon AFB, CO where he served as a Milstar Satellite Engineer and Communications Analyst. In 1997, Major Orth was reassigned to the Air Force Command and Control (C2) Training and Innovation Group at Hurlburt Field, FL where he provided communications support for numerous Numbered Air Force-level C2 exercises and experiments. In 2000, he was selected to attend the U.S. Marine Corps C2 Systems School at Quantico Marine Corps Base, VA to study operational-level joint C2. Upon graduation in 2001, Major Orth was reassigned to the Air Force C2 and ISR Center at Langley AFB, VA where he was in charge of modernization programs for Air Defense and Satellite Communications. While stationed at Langley, Major Orth also deployed twice in support of Operations NOBLE EAGLE and IRAQI FREEDOM. In 2004, he was reassigned to Headquarters, U.S. Pacific Command, Camp H.M. Smith, HI where he served as the theater lead for Information Assurance and Computer Network Defense.

In May 2007, he entered the Graduate School of Engineering and Management, Air Force Institute of Technology as an Intermediate Developmental Education student. Upon graduation, Major Orth will be assigned to the Joint Task Force for Global Network Operations at Headquarters, Defense Information Systems Agency.

# REPORT DOCUMENTATION PAGE

*Form Approved*
*OMB No. 074-0188*



| **1. REPORT DATE** *(DD-MM-YYYY)* | **2. REPORT TYPE** | **3. DATES COVERED** *(From – To)* |
|---|---|---|
| 19-06-2008 | Graduate Research Project | Jun 2007 – Jun 2008 |

**4. TITLE AND SUBTITLE**

Measuring the Operational Readiness of an Air Force Network Warfare Squadron

**5a. CONTRACT NUMBER**

**5b. GRANT NUMBER**

**5c. PROGRAM ELEMENT NUMBER**

**6. AUTHOR(S)**

Orth, Paul H., Major, USAF

**5d. PROJECT NUMBER**

ESP-WA

**5e. TASK NUMBER**

**5f. WORK UNIT NUMBER**

**7. PERFORMING ORGANIZATION NAMES(S) AND ADDRESS(S)**
Air Force Institute of Technology
Graduate School of Engineering and Management (AFIT/EN)
2950 Hobson Way
WPAFB OH 45433-7765

**8. PERFORMING ORGANIZATION REPORT NUMBER**

AFIT/ICW/ENG/08-09

**9. SPONSORING/MONITORING AGENCY NAME(S) AND ADDRESS(ES)**
315th NWS/CC
LtCol Timothy Haugh
9801 Love Rd Ste 204B timothy.haugh@ft-meade.af.mil
Ft Meade, MD 20755 (240) 373-4829

**10. SPONSOR/MONITOR'S ACRONYM(S)**

**11. SPONSOR/MONITOR'S REPORT NUMBER(S)**

**12. DISTRIBUTION/AVAILABILITY STATEMENT**

APPROVED FOR PUBLIC RELEASE; DISTRIBUTION UNLIMITED.

**13. SUPPLEMENTARY NOTES**

**14. ABSTRACT:** As part of its squadron activation, the 315th Network Warfare Squadron (NWS) requested assistance from the Air Force Institute of Technology in developing criteria for declaring Initial Operational Capability (IOC) and Full Operational Capability (FOC) to assess the unit's operational readiness. The research methodology included a review of current Department of Defense (DoD), Joint, and Air Force publications and instructions, as well as a review of three different unit activations: the new Air Force Cyberspace Command, an F/A-22 Fighter Squadron, and an Intelligence Squadron. By comparing the Joint Capabilities Integration and Development System (JCIDS) process and the Status of Resources and Training System (SORTS) process, it is clear that unit readiness is measured and reported by SORTS Category Levels (C-Level) to support wartime missions, not by IOC and FOC milestones. This paper reviews SORTS computations and provides a case study of a notional Air Force NWS to propose that any new cyber squadron should report operational readiness starting with C-5 for unit activation, then C-3 to declare initial operational readiness, and finally C-1 to declare full wartime mission readiness.

**15. SUBJECT TERMS**
Operational Readiness, Information Warfare, Computer Networks

| **16. SECURITY CLASSIFICATION OF:** | | | **17. LIMITATION OF ABSTRACT** | **18. NUMBER OF PAGES** | **19a. NAME OF RESPONSIBLE PERSON** |
|---|---|---|---|---|---|
| **REPORT** | **ABSTRACT** | **c. THIS PAGE** | | | Dr. Robert Mills, PhD (ENG) |
| **U** | **U** | **U** | **UU** | 64 | **19b. TELEPHONE NUMBER** *(Include area code)* (937) 255-3636, ext 4718 email: robert.mills@afit.edu |